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USSR Report

CONSTRUCTION AND RELATED INDUSTRIES

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GOSSTROY OFFICIAL ON NEW CONSTRUCTION IN 1985

Moscow EKONOMICHESKAYA GAZETA in Russian No 1, Jan 85 p 11

[Article by A.D. Deminov, first deputy chairman of Gosstroy USSR: "A Priority Program for the Last Year of the Five-Year Plan--The First Deputy Chairman of Gosstroy USSR, A.D. Deminov, Comments on a Map of the Most Important Priority Construction Projects for 1985 (pages 12-13)"]

[Text] The country's economic potential has been palpably increased in the past year. Fixed capital amounting to a total of 136 billion rubles was started up through the means of state capital investment.

Even more responsible tasks must be solved by Soviet builders in the final year of the five-year plan. With a 5-percent growth of state capital investment, startup of fixed capital will be increased 7.6 percent compared to 1984 and reach 146.4 billion rubles. In this way it will be possible at the end of the five-year plan to reduce the amount of unfinished construction almost to the normative level.

The words from a speech of Comrade K.U. Chernenko at a meeting of the Politburo of the CPSU Central Committee were received as a military order by the labor collectives of construction projects: "One of the key problems is capital construction. Here a high rate of growth, a large concentration of resources and better provision of materials, machines and mechanisms are designated. This will provide us with the basis for hope that the construction people will be able to put an end to shock work, improve quality and begin at last to cope with planned targets."

Cardinal measures aimed at unconditional startup of planned capacities and facilities are designated in the decree of the CPSU Central Committee and the USSR Council of Ministers "On Improving Planning, Organization and Operation of Capital Construction" adopted in the past year. Their realization will make it possible to significantly improve the state of affairs at the country's construction projects and raise efficiency of construction as well as reduce the building time of facilities.

The published map shows the most important priority construction projects of the last year of the 11th Five Year Plan.

In Sectors of the Fuel and Power Complex

More than two-thirds of the growth of electric power in 1985 will come from atomic and hydro electric power stations. Power units with a capacity of a million kilowatts will go into operation at Smolenskaya, Kurskaya, Balakovskaya (Saratov Oblast) and Zaporozhskaya AES.

A ninth unit with a capacity of 640,000 kilowatts is planned to begin operation at Sayano-Shushenskaya Hydrostation. In Tajikistan at the new Baypazinskaya GES at the Vakhsh cascade, two turbines will provide 150,000 kilowatts each, in Kirgizia they are getting ready to start up a 150,000-kilowatt unit at Tash-Kumyrskaya GES and in Georgia two 65,000-kilowatt units at Zhinvali GES.

Power units with a capacity of 800,000 kilowatts are planned to become operational at Surgutskaya GRES in Tyumen Oblast and at Permskaya GRES. Capacities will be increased at Khabarovskaya TETs, Neryungrinskaya GRES in Yakutia, Novoagrenskaya GRES in Uzbekistan, Maryyskaya GRES in Turkmenia and Azerbaydzhanskaya GRES.

Special note should be made of the startup specified by the plan of an 800,000-kilowatt power unit at Berezovskaya GRES-1 in Krasnoyarsk Kray. This will provide the basis of a broad-scale power development of the unique coal deposts for KATEK [Kansk-Achinsk Fuel and Energy Complex]. As we know,the power program provides for the construction of coal sections with a unit production capacity of up to 60 million tons a year and 6.4-million kilowatt thermal electric power stations at the Kansk-Achinsk Fuel and Energy Complex. Berezovskaya GRES will be the first in a family of such gigantic GRES. At the same time, capacities are going into operation at the Berezovskiy section for producing 4.5 million tons of coal a year.

In the coal industry, which has been called upon to become the basic supplier of fuel for thermal electric power, significant growth of capacities has been specified for 1985. The map shows priority stripping projects -- Vostochnyy (15 million tons) annually Ekibastuz, Neryungrinskiy (2 million tons) in Yakutia, Pavlovskiy No 1 (1 million tons) in Maritime Kray, Angrenskiy (700,000 tons) in Uzbekistan, Tal-Yuryakh (300,000 tons) in Magadan Oblast, mines -- Yuzhno-Donbas No 3 (1.2 million tons) in Donetsk Oblast, Komsomolets (500,000 tons) in Kemerovo Oblast, Anadyrskaya (50,000 tons in Magadan Oblast, Aktasskaya (200,000 tons) in Karaganda Oblast and Dolinskaya (200,000 tons) on Sakhalin.

In the course of 1985, the gas main pipelines Urengoy--Tsentr 2 with a length of 3,113 kilometers, Beyney--Aleksandrov Gay (340 kilometers), Kursk--Kiev (512 kilometers), Kutaisi--Sukhumi (200 kilometers) and the condensate pipeline Urengoy-Surgut (755 kilometers) are to start operation.

The map also shows petroleum main pipelines and petroleum-product pipelines.

Among the priority projects of the petroleum-refining and gas-processing, petrochemical and chemical industry, the map shows new capacities for catalytic reforming of raw material and coking of heavy petroleum residues at

Lyubertsy near Moscow, Lisichansk in Voroshilovgrad Oblast and in Novokuybyshevsk, for production of synthetic ammonia and mineral fertilizers at the associations Tol'yattiazot, Dneprodzerzhinsk's Azot and Rozdol's Sera; sulfuric acid--at Krasnodar Chemical Plant and at Chardzhou Superphosphate Plant, calcined soda--at Lisichansk and Krymsk soda plants, synthetic fiber and thread at the associations--Novopolotsk's Polimir and Svetlogorsk's Khimvolokno in Belorussia as well as at Barnaul Synthetic-Fiber Plant. Large-scale production of carbamide resins is being readied for startup at Tomsk Chemical Plant. Capacities for making synthetic rubber and tires will go into operation in Yerevan, Krasnoyarsk, Chimkent and Belaya Tserkov.

Industrial Power Is Gaining Strength

In the priority program of the last year of the five-year plan, metallurgical and machine-building facilities are broadly represented. New capacities of the Kachar Ore-Beneficiation Combine in Kustanay Oblast are counted on to produce 3 million tons of iron ore per year. The giants KMA[Kursk Magnetic Anomaly]--Lebedinskiy Ore Beneficiation Combine (0.5 million tons) in Belgorod Oblast and Mikhaylovskiy Ore Beneficiation Combine (1 million tons) in Kursk Oblast are undergoing further development. As a result of modernization, the capacity of Krivoy Rog Central Ore Beneficiation Combine will grow by 1 million tons and that of Kazskiy Mine in Kemerovo Oblast by 600,000 tons.

Modernization of Magnetic Beneficiation Factory No 2 for production of about 1.3 million tons of iron-ore concentrate per year will be completed at Nizhniy Tagil Metallurgical Combine. A total of 530,000 tons of steel a year will begin to be produced at Dalnevostochnyy Metallurgical Plant in Komsomolsk-na-Amure. Capacities for the fabrication of progressive types of rolled-metal products will grow at Novolipetsk Combine (220,000 tons), Zhdanov Combine (200,000 tons), Karaganda Combine (150,000 tons) and Moldavian Metallurgical Plant (100,000 tons) in the city of Rybnitsa. This small enterprise using metal produced in the republic will put out high-quality products. A fourth battery for the production of a million tons of coke per year is being started up at Altay Coke and Coke-Oven Byproduct Plant.

Machine-building symbols show on the map new and modernized production facilities for steam turbines in Leningrad and Kharkov, diesel engines and diesel generators in Bryansk, metallurgical and chemical equipment in Sverdlovsk, freight cars in Kremenchug, main-line electric locomotives in Novocherkassk, large electric machines in Brezhnev, industrial robots in Cherkassy, oilfield and drilling geological prospecting equipment in Baku, metal-cutting lathes in Gorkiy, Alma-Ata and Vilnius, instruments for the control and regulation of technological processes in Ulan-Ude, instrumentation for measuring mechanical factors in Kishinev, trucks in Kutaisi and Tractors in Rubtsovsk, combines in Krasnoyarsk and Kherson, machines for animal husbandry and fodder production in Kolomyye of Ivano-Frankovsk Oblast and Mogilev and technological equipment for light, food, meat-and-dairy and fish industry in Orsha of Vitebsk Oblast, Krasnoarmeysk of Saratov Oblast and Makhachkala.

In the timber, woodworking and pulp-and-paper industry, 1985 is being marked for the startup of capacities for the manufacture of wood-shaving and wood-

fiber board in Krasnoyarsk, Maritime Kray and Kalinin Oblast, furniture in Leningrad and Makhachkala and paper in Syktyvkar.

At the end of the five-year plan, the construction of new and modernization of existing enterprises of the construction materials industry, structures and the production base of construction organizations will be completed. Reference is made to production facilities for cement at Rezina Plant (1,150,000 tons) in Moldavia, Nikolayevsk Cement and Mining Combine (650,000 tons) in Lvov Oblast and Akhangaran Cement Combine (450,000 tons) in Tashkent Oblast, slate at Dushanbe Combine for Asbestos and Cement Products (114 million standard tiles), ceramic facing materials at Kharkov Tile Plant (700,000 square meters), brick in Irkutsk, Amur and Minsk oblasts, Georgia and Latvia and reinforced concrete in Sverdlovsk, Tyumen, Surgut and Astrakhan Oblast.

For the People's Well-Being

Modern equipment for the production of high-quality consumer goods is being used to equip new and modernized enterprises of the light, food and meat-and-dairy industry. On the map of priority construction projects, affiliates are shown of Bukhara Textile Combine in Karakul Village, where 34,000 spindles are being installed and in the city of Dzharkurgan (560,000 looms). Thirty-four thousand spindles will make their appearance at a factory in the Karakalpak city of Beruni, and about 105,000 spindles will be delivered to Tselinograd Thread-Spinning Factory in the course of the year.

Hundreds of new looms will be introduced at textile enterprises in Ufa, the Karakalpak city of Khodzheyli, Moldavia's Bendery, Kirghiz Kara-Balta, Georgian Vani, Estonian Narva and in the Tajik village of Gissar.

Startup is planned of large capacities for the production of knitted underwear in the city of Khodzhaabad of Andizhan Oblast and Frunze and stockings and socks in Dimitrovgrad and Klaypeda.

A new production facility has been planned at the 17th Khmelnitskiy Sugar Refining Plant for processing of 60,000 quintals of beet per day. Following modernization, 100 tons of oil seeds will be able to be processed daily at an oil-extraction plant in Kagan of Bukhara Oblast. The capacities of Tallin's Kalev Confectionery Factory will be perceptibly increased.

With the startup of new or modernized existing production facilities, the output of fruit and vegetable canned products will be increased in Odessa and Kashka-Darya oblasts, Alma-Ata and Georgia.

The construction of meat combines will be completed in 1985 in Dubno ofRovno Oblast, Mogilev, Dzhizak and Mary. Production will be expanded of whole-milk products at city dairy plants in Astrakhan, Penza, Ordzhonikidze, Sumy, Termez, Gori, Nakhichevan, Telshyay, Ura-Tyube and Kafan.

The published map acquaints us only with the most important priority projects of production designation. At the same time, housing and cultural and

personal-services construction is going on at each large and small populated place.

The plan for 1985 includes a group of measures for raising the living standard of the Soviet people, first of all in regard to improving housing conditions. Residential buildings will be built with a total floorspace of 114 million square meters, which is 10.7 million square meters more than was designated by the five-year plan for this year.

Special attention is directed to the comprehensiveness of such construction. In 1985, schools with 951,000 places, children's preschool institutions with 630,000 places, hospitals with 60,000 beds, outpatient polyclinic institutions with 116,000 visits per shift are to be opened for use. All this significantly exceeds the targets of the five-year plan.

Poultry Factories, Complexes and Hothouse Combines

It is no less important, given our tremendous scale of construction and economic activity, to provide effective measures not only for conserving but also for improving the surrounding natural environment. About 2.5 billion rubles of state capital investment are being allocated for the realization of a complex of measures in this field.

Builders are making a significant contribution to the realization of the country's food program by carrying out construction and modernization of agricultural production facilities. Among the most important priority projects for 1985, we see factories of the egg variety in Bryansk, Tula, Perm and Chita oblasts, Kirgizia and Tajikistan and of the meat variety in Belgorod, Andizhan and North Kazakhstan oblasts, Chuvashia, Azerbaijan, Kirghizia and Armenia.

Complexes for growing and fattening young cattle stock will become operational at the sovkhozes Tavricheskiy (8,000 head) of Omsk Oblast and Zarya (5,000 head) of Grodno Oblast. Very large swine complexes are planned for startup on farms in Kuybyshev, Arkhangelsk, Perm, Tyumen and Brest oblasts.

Areas of covered ground are being expanded at hothouse combines in Stavropol Kray and Chuvashia and Kostroma, Alma-Ata, Mary and Dzhizak oblasts, Krasnodar and Krasnoyarsk krays, Lithuania and Komi ASSR.

Among procurement facilities on the map of priority projects for 1985, there are shown elevators, each of which is designed for tens of thousands of tons of simultaneous grain storage. Their construction is being completed in Ryazan, Penza, and Transcarpathian, Chernigov, Gomel, Khorezm, North Kazakhstan, Tselinograd, Kurgan-Tyube and Ashkhabad oblasts, Krasnodar and Stavropol krays and Lithuania and Estonia.

Milling production facilities getting ready for startup in Khabarovsk, Rostov-na-Donu, Krasnodar Kray, Vinnitsa, Zhitomir and Grodno oblast, Kirghizia, Tajikistan and Armenia will each be processing 500-600 tons of grain per day.

Development of the Transport System

Having opened up ahead of schedule through operational movement of trains on the Baykal-Amur Main Line, transport builders are preparing for turning over for constant operation two large BAM sectors--Tynda-Urgal, a length of 325 kilometers, and Chara-Tynda, a length of 337 kilometers. The lines Yevlakh-Belokanyh, Aktogay-Sayak, Kholmogory-Urengoy are planned to go into constant operation in 1985. On a number of railroads second routes are being laid, and electrification is being carried out.

Highly mechanized piers and transshipment complexes will be put into operation in the seaports of Vladivostok, Nakhodka, Petropavlovsk-Kamchatskiy, Nikolayev and Izmail and for a second section of the ferry crossing Vanino--Kholmsk as well as the river ports Vazhina in Leningrad Oblast, Osetrovo in Irkutsk Oblast, Krasnoyarsk and at Kurmenty Wharf in Kirghizia.

* * *

The 1985 priority program is very full and requires of builders, installation and operational people precise cooperation, friendly and coordinated work. These days construction-project collectives are assuming socialist commitments for the final year of the five-year plan. A most important point in them provides for timely and ahead-of-schedule startup of all planned capacities and facilities.

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STATE OF USSR CONSTRUCTION TECHNOLOGY REVIEWED

Moscow MEKHANIZATSIYA STROITEL'STVA in Russian No 11, Nov 84 pp 2-6

[Article by R. R. Kormilitsyn, special correspondent, MEKHANIZATSIYA STROITEL'STVA: "At the Junctures of Focal Questions"]

/Text/ In September of this year Donetsk witnessed the holding of a conference entitled "Scientific and Technical Progress in the Organization and Technology of Construction Production in Industrial Construction," which was organized by the Central and Donetsk Oblast Boards of the Construction Industry NTO /Scientific and Technical Society/, as well as by USSR Gosstroy. Also taking part in the work of this conference were the managers and specialists of USSR ministries and departments, important officials of USSR Gosplan, scientists, and representatives of construction organizations from many of the country's republics and oblasts.

The principal report--concerning the influence of scientific and technical progress on the pace and quality of construction--was delivered by the deputy chairman of USSR Gosstroy, I. A. Ganichev.

Guided by the recommendations of this conference's organizing committee, the journal MEKHANIZATSIYA STROITEL'STVA has published more than 50 articles* on various aspects of its program, as well as those appropriate to this journal's topical thrust. In this connection, the notes published below deal merely with certain "junctures" of the questions which were examined in Donetsk.

In his detailed, multi-faceted report I. A. Ganichev emphasized particularly that the CPSU Central Committee and the USSR Council of Ministers by the decree entitled "On Improving the Planning, Organization, and Administration of Capital Construction" have indicated what constant attention the party and state have been according to this matter.

During the course of the 9th, 10th, and three years of the 11th Five-Year Plans more than 3,200 industrial enterprises have been built and put into

* MEKHANIZATSIYA STROITEL'STVA, No 4--9, 1984.

operation along with apartment houses having a total area of more than 1.3 billion sq. m. The volume of construction-and-installation work during this period almost doubled. Completely prefabricated construction constituted more than 40 percent within the program of the principal construction ministries.

Nevertheless, there are quite a few unsolved problems in capital construction. Plans for putting capacities and facilities into operation have not been carried out, and the length of time required to construct enterprises and facilities is considerably greater than the norm. Nor have shortcomings been eliminated in matters of planning, organizing, and estimating, in organizing and adminstering capital construction. There has been a weakening of the responsibility of the client-ministries, their associations and enterprises, as well as the construction ministries for fulfilling assignments with regard to putting capacities and facilities into operation, effectively utilizing capital investments, and improving financial-economic indicators in construction. The scope of work on modernizing and re-tooling production is insufficient. The principles of cost accounting have not been introduced vigorously enough, many construction-and-installation organizations have been operating at a loss, and there are instances of a poor quality of SMR /construction-and-installation work/.

Radical improvement of affairs in capital construction can be achieved solely on the basis of further industrialization, a multi-faceted engineering training for construction, perfecting organizational and administrative forms, as well as economic incentives, and the introduction of the brigade form of labor organization. At the same time a complex of organizational measures is the least capital-intensive and the most important with regard to its effect. Moreover, an outstanding role is assigned here to the plans for organizing construction (POS); together with the engineering plan, they constitute a directive document, regulating production organization and technology.

Comrade Ganichev directed the attention of the conference participants to the necessity for a determined conversion to progressive methods of construction, for example, the focal method, which allows the time period required for construction to be reduced by 5--7 percent and labor productivity to be raised by 1.2--1.5 percent.

For several years now the journal MEKHANIZATSIYA STROITEL'STVA in articles and reports under the column heading "The Complete-Unit Method: Perfect and Introduce It on a Broad Basis" has been persistently propagandizing this prospective organizational-technical innovation, the essence of which lies in the delivery to construction of complete units of technical equipment, construction, structural-technical units, and communications units which have been manufactured completely at the plant, as well as their rapid installation at the construction site. However, Comrade Ganichev noted, because of today's lack of specialized bases for the construction industry, the consolidated prefabrication of structural components and technical equipment in unit-type arrangements is being carried out principally at the construction sites or at areas close by them without the necessary equipment and supplies and with great outlays of labor, while the fundamental idea of the complete-unit method (KBM)--the transfer of labor outlays from the construction site to stationary conditions--remains unrealized.

Development of the complete-unit method and expansion of the field of its use are being retarded because of the lack of a normative-methodological base, regulating, in particular, questions of creating special production bases and the means of transporting units.

Introduction of the KBM allows the length of time required to build facilities to be reduced by a factor of approximately 1.5 and the labor outlays by 10--12 years for every million rubles of SMR. A strategic program must be drawn up for making the transition to complete-unit construction.

At the present-day phase of the development of productive forces an exacerbated need has come about for mobile construction organizations, particularly for regions with an insufficiently developed construction industrial base. In the very near future the construction ministries will be confronted with the task of coordinating with USSR Gosplan and USSR Gossnab regions of activity of mobile organizations, taking into account the expansion, modernization, and technical re-tooling of existing and the creation of new rear-support bases for material and technical supply to construction.

The institutes of USSR Gosstroy must draw up recommendations for the constructions ministries with regard to the enumeration and specialization of mobile organizations, their material and technical equipment, a table of machine-worker ratios which would be optimal for each rayon or region encompassing a radius of activity. During the course of 1984--1985 the construction ministries need to furnish the mobile construction-and-installation organizations with the following items, which are in short supply: highly productive machinery, tools, transport means, mobile production and residential-services buildings which can be assembled and disassembled. It is important that the fixed capital assets of these organizations have the maximum yield and become effective in the very near future. This must comprise the task of the apparatus of the construction ministries, the main administrations, the scientific research institutes, the orgtekhstroys /technical construction facilities/, and the scientific community.

In 1984--1985 USSR Gosstroy is planning to revise the normative-technical documentation with regard to construction organization and technology in order to establish more rigorous obligatory requirements with respect to improving engineering training, increasing technological discipline, the expanded use of assembly-line methods and progressive technologies in construction production, as well as to improve the labor organization of workers.

A decree of the CPSU Central Committee and the USSR Council of Ministers provides for the implementation of technical experience in the organizations of the Main Administration for Construction in the Central Urals of the USSR Ministry of Construction of Heavy Industry Enterprises, the Main Adminstration for Construction in the Central Volga Region of the USSR Ministry of Industrial Construction, the Main Administration for Construction in the Western Regions of the USSR Ministry of Construction, as well as in the Belorussian SSR Ministry of Industrial Construction and the Ministry of Rural Construction, with regard to the construction and "turnkey" handing over of a number of production facilities, apartment houses, and social-everyday-service types of facilities, along with plans and estimates, coordinated between clients and contractors.

This experience is calculated to increase the responsibility of all units of the investment cycle, and of all the organizations. The role of the planners has been sharply enhanced. It is not just a matter of the on-time handing over of the documentation but also of carrying out a targeted, technical policy, the essence of which is reducing the expenditures of all types of resources and, above all, those at the construction site, along with the further industrialization of construction.

We must ensure the broad-based introduction of conveyor-type prefabrication and the large-unit installation of roofs in industrial buildings, as well as the complete-unit installation of built-in spaces, transport galleries, unit-type arrangements of electrical equipment, and highly industrialized methods of installing engineering and technological communications.

The speaker noted the necessity for solving the production of many kinds of operations on a new technological and organizational basis. And, above all, concrete operations. He posed the problem of the comprehensively mechanized delivery and placing of concrete mix with the aid of truck-mounted concrete-mixers (ABS) and concrete trucks, hydraulic concrete pumps, and belt-type concrete placers.

Builders are still failing to make satisfactory use of the available pool of highly productive equipment.

If everyone were to achieve the designed operational productivity of the truck-mounted concrete-mixers, concrete pumps, and other equipment, the task of increasing labor productivity for the 11th Five-Year Plan would be carried out more successfully.

In the construction of buildings the placing of ancillary and cast concrete mixes with superplastifiers allows us to reduce labor outlays at the construction site, to increase productivity, and improve working conditions.

The total share of concrete being placed by specialized, concrete-placing complexes, depending upon the supplies of superplastifiers, can amount to 10-15 percent, thanks to which approximately 1000 persons a year can be freed up.

A significant effect in reducing labor expenditures with the least possible capital investments is provided by the industrialization of formwork. Today the technical level of means of mechanization and organizational forms are in substantial contradiction. By a directive letter in 1982 USSR Gosstroy proposed that the construction ministries and departments organize specialized subdivisions for carrying out concrete operations on a sub-contractual basis. But so far only the USSR Ministry of Construction has created such sub-divisions within territorial administrations.

The TsNIIOMTP /Central Scientific-Research and Experimental-Planning Institute for Organization, Mechanization, and Technical Aid to Construction/ and other organizations have developed an effective technology for installing enclosing structural components made of asbestos-cement, extrusion panels, including those with pre-enlarged prefabrication, as well as complete sets of technical fittings, equipment, and tools, which allow us to comprehensively mechanize the

process of installing the enclosing structural components, as well as to reduce the labor outlays and installation costs.

As was the case previously, the complex of finishing and roofing operations remains the most labor-consuming.

For the 12th Five-Year Plan expanding the amounts of using fused-on ruberoid will remain the general trend in the technology of roofing operations. When using fused-on ruberoid, the labor productivity is 1.8--2 times as great as in the case of using the usual ruberoid on adhesive mastics. Conversion to a simple technology of glueing the fused-on ruberoids does not require capital outlays for the construction ministries.

In the field of finishing operations the conversion to "dry" methods of sheet and tile materials is the general trend. But we must not lessen our attention to the questions of industrializing the finishing operations by the traditional methods. Performing single-layer plastering by using mortars manufactured in a centralized fashion and mortars using dry mixes of limestone and cement binders with the addition of polymer substances reduces the labor outlays by 20--25 percent and improves the quality of the plastered surfaces. Production of plastering operations by using mortars made of dry, gypsum mixes improves the quality of the plaster coatings, while reducing the labor outlays at the construction site and the time periods required for carrying out the operations. The use of gypsum, self-equalizing constricting devices allows us to increase labor productivity by a factor of 2--2.5, as compared with an arrangement of constricting devices made of rigid, cement-sand mortars.

The replacement of physically heavy, harmful, dangerous, and monotonous work by means of utilizing new types of machinery will permit us to make a qualitative leap of labor productivity in construction. There is an increasing role played by the automation of production processes as the most important factor of modern-day technical progress, a powerful means of raising productivity and improving working conditions.

The TsNIIOMTP has developed a list of processes for top-priority automation and robotization. The chief task at the present-day stage is to implement the plans of automation, to develop the technical means, and create a reliable system for using automatic equipment and repairing it effectively.

Increased attention must be paid by the production organizations to the problem of delivering construction items. At the present time the proportion of containerized and packaged construction items within the total amount of hauls comprises only 5 percent. Particularly effective is the delivery of containerized and packaged items by means of truck transport equipped with loading-and-unloading devices.

The economic effect derived from introducing a system of delivering construction items in containers and packages by means of truck transport equipped with loading-and-unloading devices amounts, on an average, to 30,000 rubles a year per one such means.

The principal causes hindering the broad-based introduction of the new system for delivering items are as follows: the lack of complete sets of items for

manufacturing specialized means of truck transport with self-unloading devices; the lack of serial manufacture of containers and specialized means with loading-and-unloading devices; departmental disconnection between those persons engaged in delivering items.

The CPSU Central Committee and the USSR Council of Ministers have been particularly sharp in assigning builders the task of using all measures to economize on all types of resources. Solving this problem is connected with increasing technical discipline in all sections of construction production, introducing and using more effectively new machinery, mechanisms, equipment, tools, and fittings. During 1984--1985 the construction ministries are confronted with the task of ensuring the complete concentration of the basic machinery and means of small-scale mechanization in specialized mechanization sub-divisions (trusts and mechanization administrations, as well as small-scale mechanization administrations), increasing the role and responsibility of these organizations in carrying out the comprehensive mechanization and automation of construction operations, along with reducing labor outlays.

One of the urgent tasks is to further develop the centralized, capital repair of the basic construction machinery and motor vehicles, to concentrate and specialize repair production.

The CPSU Central Committee and the USSR Council of Ministers have adopted the proposals of a number of ministries concerning the singling out of construction and installation organizations, as well as enterprises in the construction industry, models in using the new equipment, advanced technology, the comprehensive mechanization of construction, with regard to economizing on material resources, ensuring high labor productivity and standards, good work quality, and the introduction of progressive Soviet and foreign experience in operational production.

Staff members of the TsNIIOMTP and the orgtekhstroys of the construction ministries are confronted with the task of rendering constant techical aid to the model construction and installation organizations. It is a matter of the rational outfitting of construction sub-divisions, forming the best administrative structure, taking into account the specific local conditions, ensuring the uninterrupted growth of return on investment, working out programs for increasing the industrial nature of construction, calculated for the five-year period and ensuring the growth of labor productivity, while considerably outstripping the average indicators for the sector. The scientific and technical community must, to the maximum degree, direct its work in the first phase at creating a network of model construction-and-installation organizations, and then--at expanding positive experience in each territorial construction administration.

In the material of USSR Gosplan's Division of Construction and the Construction Industry, as presented at the conference, it was noted that, despite the increase in the nominal capital requirements per ruble of output of construction production and the machine-worker ratio, there are still technological processes with a low level of comprehensive mechanization. Slightly less than half of the workers in construction are engaged in manual labor. Growth in labor productivity lags behind the planned rate. During the 10th Five-Year Plan labor productivity grew by only 11 percent, as compared with the plan

amount of 23.3 percent (computed as the total of the yearly assignments). With respect to the principal construction ministries the plan of contract operations was not fulfilled in one year of the 10th Five-Year Plan and three years of the 11th Five-Year Plan.

Deserving of attention is the proposal of a number of construction ministries to the effect that, in order to ensure a higher technical level of construction and speed up the pace of scientific and technical progress, it would be feasible to transfer a certain amount of the working planning to the construction ministries. This would allow the conduct of a uniform technical policy and would increase the performer's responsibility for the technical level of construction. The construction ministry would be able to plan for the design and construction organizations the tasks with regard to new equipment, interrelated tasks, taking into account the regional and other characteristics of construction and thereby providing a genuine technical-economical effect.

These problems can be solved and are being solved most successfully and effectively in scientific-production associations (NPO's), which constitute an integrated, scientific-production, and economic complex; the latter includes scientific-research, design, planning-design, construction, start-up and tune-up, and other structural units. During the next few years the construction ministries, as well as the system of the USSR Ministry of Construction, Road and Municipal Machine Building and the USSR Ministry of the Construction Materials Industry, will be conducting active work with regard to organizing such associations.

A serious cause reducing the effectiveness of capital construction is the insufficient level of the construction organizations' stocks of equipment, their power-worker and machine-worker ratios. On this plane the questions of mechanizing construction ought to be considered, above all, as one of the fundamental factors in the increase of labor productivity. The most objective indicator characterizing the degree of furnishing manpower with the means of mechanization is the power-worker ratio. Moreover, as practical experience has shown, the planned growth rate of labor productivity must be ensured by an outstripping growth rate of the power-worker ratio.

The effectiveness of a forced growth in the power-worker ratio can be clearly illustrated by using the example of the Ministry of Construction of Petroleum and Gas Industry Enterprises. In connection with the need to solve a number of targeted problems connected with providing the country with fuel, measures were adopted to speed up the re-tooling of this ministry; for this purpose, a considerable number of pipe-layers with a load-hoisting capacity of 50 tons, as well as bulldozers with a traction class of 25--30 tons, single-bucket excavators with a bucket capacity of 1.5 cu. meters, special means of transport, electric power plants, and welding equipment. Under extreme climatic and geological conditions the targeted problems were solved within compressed time periods. As of 1 January 1983, the level of the power-worker ratio in the Ministry of Construction of Petroleum and Gas Industry Enterprises amounted to 36.4 kW per worker, which is more than triple the amount in other contracting ministries. Likewise appropriately higher in this ministry than in the other contracting ministries is the growth rate of labor productivity; in 1981 it came to 5.4 percent, in 1982--to 9 percent, and in 1983--to 5.4 percent.

Experience in building the BAM, facilities for the 1980 Olympics, as well as a number of other facilities in various sectors of the national economy, testify to the high effectiveness of the power-worker ratio.

During the current five-year plan more than 13.6 billion rubles have been allocated to acquire equipment not included in the estimates for the construction projects for the "Construction" sector. As a result, the balance-sheet cost of construction equipment and transport in this sector grew from 15.9 billion rubles in 1981 to 19 billion rubles in 1985. During the years 1981--1984 alone construction was supplied with about 36,000 single-bucket excavators, 35,000 bulldozers, 1,630 scrapers, 40,700 boom cranes, and 880 tower cranes, as well as a great deal of other equipment and tools. As a result of the measures being adopted, the machine-worker ratio in construction during the period from 1976 through 1983 increased by 36.2 percent, the tool-worker ratio rose by 56 percent. In this connection, however, the power-worker ratio increased by only 17.5 percent, while labor productivity rose by 11.7 percent.

Raising the level of the machine-worker ratio has permitted a certain reduction in the outlays of manual labor in the basic types of construction and installation operations. In particular, the amounts of earthwork being performed manually were reduced in 1983, as compared to the 1980 level, by 14.3 percent, loading-and-unloading operations--by 23.6 percent, concrete operations--by 3.1 percent, plastering operations--by 7.1 percent, painting operations--by 8.4 percent, and the preparation of concrete and mortar--by 5.6 percent and 15 percent respectively.

It must be noted that the construction organizations are still receiving poorly productive and insufficiently effective equipment in considerable quantities; the average unit capacity of the pool of basic construction machines remained practically unchanged during the years of the 11th Five-Year Plan. For example, within the total 1983 deliveries to construction comprising 6,700 bulldozers, there were 4,100 units, or 61 percent, with 3 ton-force traction power, while, out of 6,200 truck-mounted cranes, machines with a load-hoisting capacity of 6.3 tons amounted to 3,600 units, or 58 percent. The pool of the contracting construction organizations have many obsolete machines.

The not-so-high qualitative level of construction and road machinery, the means of small-scale mechanization, manual and mechanized tools is to be explained not only by the lag in developing the sector of construction and road machine building but also by the insufficient allotment to the sector of high-quality steels with a creep limit of 80--100 kg force/m^2 (primarily, steels with a strength of 30--40 kg force/m^2), special types of electric motors, starter-regulating apparatus, automatic and protection devices, diesel motors with special characteristics (motor-vehicle and tractor motors do not meet the requirements of construction and road machine building), plastics for the manufacture of electrical tools with double insulation, special types of rubber for packing in hydraulic systems. Nor have the following problems been solved: production of special chassis for truck-mounted cranes with a load-hoisting capacity of 25 tons or more (up to 400 tons), base-type machines for producing a parametric series of wheeled, front-loaders and bulldozers on pneumatic tires, having a capacity of 10--30 tons of traction, for producing multi-purpose earth-moving-transport mini-vehicles, which have gained widespread acceptance

in world practice at the present time; nor are there motors and tractor rubber with the necessary parameters.

If we develop the thesis of the outstripping growth of the power-worker ratio, then in the future there must be a significant increase in the power-worker ratio in construction. Regrettably, the actual average-annual growth rate of the power-worker ratio during the years 1980--1982 amounted to only 0.2 percent.

In order to guarantee the successful solution of the problems confronting construction in 1985 and the 12th Five-Year Plan with regard to growth of labor productivity by means of the mechanization factor, it is necessary, USSR Gosplan's Division of Construction and the Construction Industry considers, in the first place, to carry out the re-tooling of the construction organizations by means of delivering new machines with an increased unit capacity and greater reliability, with an expanded range of their engineering capabilities by means of supplying various types of easily mountable and changeable working equipment; we must also develop and organize the production of new construction machines, including front loaders with a load-hoisting capacity of 6 tons and more, cranes mounted on special, truck-type chassis having a load-hoisting capacity of 400--100 tons, small-size, multi-purpose, hydraulic machines with capacities ranging from 8 to 35 horsepower for mechanizing small-scale operations; we need to create and organize the serial production of equipment for diagnosing, technically servicing, and repairing machines; to improve the providing of construction machines, as well as the base-type machines (trucks and tractors) with spare parts and repair-operational materials; to increase the deliveries of mechanized tools, as well as to organize their effective use.

The question of providing workers with tools, obviously, should be given particular consideration. According to the data of USSR Gossnab, the need of the construction ministries and departments for mechanized construction and installation tools is being met by 70 percent, for construction-and-finishing machines--by 65 percent, for vibrators--by 50 percent, for manual construction-and-installation tools--by 60 percent. The need for electric drills is being met by 20 percent, for mortar pumps--by 47 percent, for electric channeling machines--by 48 percent, and for current frequency transformers--by only 28 percent. Moreover, these tools sometimes lie around in the warehouses of the construction administrations, while there are none at the construction projects. Certain means of mechanization, for example, up-to-date airless spray-painting apparatus and electric drills, now being turned out by our country's industry and not inferior in quality to the best world models, have not found a market or widespread use. One comes to the conclusion that the builders do not always have the motivated interest to mechanize labor, while the lack of the necessary system for providing and issuing tools, as envisaged by the "Statute on Organizing the Tool System in Construction," reduces to naught the efforts of the administrative-technical personnel to introduce it.

Targeted, comprehensive programs (0.21.01Ts) provide for developing and organizing the production of new types of construction equipment--heavy-duty bulldozers and pipe-layers, hydraulic hammers, earth-moving and milling machines, truck-mounted concrete pumps and truck-mounted concrete mixers, mobile, automated, concrete-mixing units, and new mechanized tools. A plan is being worked out for the new scientific and technical program for the period until the year

2000; it provides for the creation of heavy-duty, self-powered scrapers, hydraulic cranes mounted on special chassis having a load-hoisting capacity of as much as 250 tons, self-powered, multi-purpose construction machines, hydraulic manipulators, and new models of tower cranes. Also provided for is the construction of plants to produce these machines. In connection with this, it can be assumed that the level of machine-worker ratio in construction, taking into account the growth rates achieved during the 12th Five-Year Plan, will increase significantly, and this, in the final analysis, will allow us to attain a growth of labor productivity in construction.

Included among the most important factors exerting a great influence on the fulfillment of the plan indicators is a complex of measures on further industrializing construction, introducing progressive, highly efficient structural components and materials, increasing their degree of plant manufacture, as well as introducing progressive methods of organizing construction and labor.

During the years 1981--1983 work continued on carrying out the tasks and phases of the "Targeted, Comprehensive, Scientific and Technical Program for Developing Progressive Technologies and Industrial Methods of Construction, Based on the Creation and Widespread Use of Effective Construction Materials, Products, and Structural Components, Machines, Equipment, and Tools, Ensuring a Reduction, When They Are Used in Construction, of Labor Consumption by 25 Percent and Material Consumption by 10 Percent," as well as the tasks of programs for solving scientific and technical problems.

In accordance with the above-indicated programs, during the years 1981--1983, 2,165 stages were supposed to be completed. Of these, 1,825 stages were carried out, including scientific-research projects, developments, the manufacture of experimental models and testing new models of equipment, structural components, materials, technologies, the beginning of mass introduction, etc.

Implementation of these programs will allow us as early as 1985 to save, in comparison with 1980, 1.4 million tons of steel, more than 3 million tons of cement, and about 8 million tons of standard fuel. The labor of more than 300,000 persons will be conserved, and important social problems will be solved.

The principal thrust of scientific and technical progress in the construction complex in the future is the development of and making the transition to a universal, broad-based utilization of up-to-date industrial construction systems, the most general distinguishing feature of which is the creation of an integrated, industrial-construction conveyor, functioning on the basis of interrelated technical parameters, production and economic indicators (criteria), and norms.

Candidate of Technical Sciences G. K. Lubenets devoted his report to experience of applying the focal method of construction in the Ukrainian SSR Ministry of Construction of Heavy Industry Enterprises. He noted that the Ukrainian SSR Ministry of Construction of Heavy Industry Enterprises, the Kiev Engineering-Construction Institute of the Ukrainian Ministry of Higher Educational Institutions, and the State Institute of the Dneper Promstroyproyekt of USSR Gosstroy, together with other scientific-research and planning institutes, are

conducting a search for new forms and effective methods for organizing and administering the construction of complex projects and major industrial complexes. As a result, a new and effective form of construction organization and administration was created--the focal method of planning, preparing, organizing, and administering the construction of complex projects and major industrial complexes. As presented at the USSR VDNKh /Exhibition of USSR National Economic Achievements/, this method has found widespread acceptance at the construction sites of the Donets Basin and the Dneper Region. Every year the organizations of the Ukrainian SSR Ministry of Construction of Heavy Industry Enterprises and the Ukrainian SSR Ministry of Installation and Special Construction Work build about 150 complex facilities and major industrial complexes using the focal method and at which the SMR assimilates more than 400 million rubles.

USSR Gosstroy has specified concrete measures for the universal introduction of the focal method.

The essence of the focal method consists in the fact that, based on functional and time dependent factors, taking into consideration the sectorial specifics of the production lines, the personnel staff of a complex facility or a major industrial complex is allocated constructionally and technologically individuated sections--units for the purpose of organizing well-targeted and technologically well-grounded production work and the attainment within the briefest possible time periods of the technical readiness needed for the autonomous testing and tuning up of individual production lines, departments, and installations.

A focal unit is a constructively and technologically individuated part of an industrial complex (facility) to be erected (re-tooled or modernized); the technical readiness of such a complex, after the completion of construction and installation operations, allows the conduct of start-up and tune-up operations and the testing out of assemblies, mechanisms, and apparatus. Such units are sub-divided, according to their purpose, into technological, construction, and general-site types.

Within the most labor-consuming and complex units, sub-units are separated out in order to reduce the time periods required to erect them by means of the greatest possible combination in producing construction, installation, and special operations.

In contrast to the existing practice of preparing and organizing the construction of large-scale complexes, this method allows us to qualitatively raise the level of administering construction production, creates the conditions for integrating organizational-technological solutions and documentation, increases the reliability of the decisions being taken, and provides the opportunity for reducing the length of time required for the investment period to create production capacities.

V. M. Orlov (USSR Ministry of Installation and Special Construction Work) in his report stated that the ministry is according great significance to further increasing the mechanization of installation and special construction operations and to lowering, on this basis, the level of manual labor performed by the workers. Operating within the organizations of this ministry are more

than 40,000 construction machines, including 17,500 installation cranes. Approximately 80 percent of the cranes and other machines in operation were manufactured at this ministry's plants.

Work is continuing on the creation of cranes with a large load-hoisting capacity, as well as effective equipment for special construction operations. In particular, production is being expanded of mobile cranes with load-hoisting capacities of 63, 100, and 160 tons; a crane is being developed with a load-hoisting capacity of 250 tons, as is also a truck-mounted hydraulic-type hoist with a load height extending up to 45 meters.

Every year this sector's enterprises turn out 460 brands of means of small-scale mechanization and special tools.

As a result of the measures which have been carried out, the machine-worker ration of installation operations during three years of the 11th Five-Year Plan increased by 10.6 percent, while the power-worker ratio attained a level of 11.5 kW per worker.

According to the results of the USSR Central Statistical Administration, the level of manual labor as of 1 August 1983 in the ministry's organizations amounted to the following: in construction--45.6 percent, and in industry--40.6 percent.

The report by P. I. Moiseyev (USSR Gosstroy) was devoted to questions of mechanization and automation, their role in developing scientific and technical progress in capital construction. This was reflected in the reports by Ye. A. Dolginin (TsNIIOMTP), M. V. Tolmachev (USSR Ministry of Construction of Heavy Industry Enterprises), and other conference participants. A number of important theses examined here have served as materials for basing targeted articles and correspondence printed in MEKHANIZATSIYA STROITEL'STVO (April--September of this year), as well as the appropriate sections entitled "Recommendations" of the Donetsk Conference, which after their final formulation, will be set forth in the pages of this journal.

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CONSTRUCTION PLANNING AND ECONOMICS

REORGANIZATION OF CONSTRUCTION MANAGEMENT PROPOSED

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[Article by P.D. Podshivalenko, professor: "Improving the Organization and Management of Construction (on the order of a discussion)"]

[Text] In the years of the 10th Five-Year Plan, state and cooperative enterprises and organizations, the kolkhozes and the population have introduced 29 percent more fixed capital into operation than in the 9th Five-Year Plan. In 1982 the amount of fixed capital introduced was 6 percent more than in 1980. Hundreds of enterprises have been re-tooled and reconstructed on a new technological base.

1983 is characterized by positive shifts denoted in investment policy. However, in capital construction, not all the reserves are yet being utilized to their full degree and certain shortcomings are not being corrected. Also, measures for improving the planning and management of the entire economic management mechanism are being implemented slowly and only partially. As a result, the basic tasks of the construction industry and its associated sectors are not being totally fulfilled in terms of increasing production capacities on the basis of achievements in scientific-technical progress. Therefore, the questions of comprehensive improvement of organizational forms of construction and the search for a more rational structure in administrative and economic management activity come to the forefront. Here we must certainly not reject the necessity of more effectively utilizing the already available endeavors in the sphere of improving the management of the sector. It is specifically from these standpoints that we must examine the presently existing organizational forms and methods of construction management, methods for their re-structuring, and recommendations for further improvement.

The system of economic relations in construction at the present time is based on the following basic principles. Construction is performed primarily by the contract method. The customer contracts out the production of construction-installation work to contracting organizations, provides for the delivery of equipment by machine building plants, and assigns project planning organizations the development of project-estimate documentation. Together with the contractor he submits the finished capacities and facilities to state commissions for their operational acceptance.

In the course of fulfilling the building program, the contracting organization submits to the client the commodity building production. However, its plan volume is not set for the customer. Commodity production is reflected in the reports after signing the acceptance documents, without waiting for their ratification.

Having worked out the projects and estimates, the project planning organization forwards them for ratification and inspection by the customer. After this, it is included into commodity project production, even if the construction is not begun, and even if it is not provided for in the plan.

The machine building plants, having shipped the equipment to the customer and receiving notice of its payment, thereby fulfill the plan for realization of production, even though it may sit for years at construction site warehouses (which often is the case). Here we must also note that the equipment arrives at the construction site piecemeal, with only 10 percent of it being supplied in sets by the suppliers.

Specialized installation, finishing and other organizations of this type consider their work to be finished when they submit the completed work complexes.

Thus, the end result of building production represents a certain conglomerate of results of the activity of various departments, which in essence reduces the responsibility of any one of them for the operational introduction of the capacities and facilities, gives rise to various conflicting situations, mutual pretensions, and increases the volume of intermediate results which are expressed in the growth of unfinished construction and reserves of unutilized commodity-material goods. As a result, in fulfilling the plan for contract work in the 9th Five-Year Plan by 99.8 percent, the operational introduction of capacities by primary sectors was underfulfilled by 30-40 percent. The situation was similar also in the 10th Five-Year Plan, but with a slightly lesser underfulfillment. Here the contractors place the blame on shortages in supply of materials. The question arises--at the expense of what is the contract program being fulfilled as a whole? And moreover, how is it that the building industry enterprises have been left with above-norm reserves of commodity-material goods, including metal, pipes and constructions in the sum of over 300-500 million rubles at the end of each year of the 9th and 10th Five-Year Plans? They also complain of a shortage of work force. However, if we consider the worker turnover and the non-fulfillment of tasks on the growth of labor productivity, it turns out that in general there is an overabundance of workers.

Many pretensions have been voiced in connection with the shortages of equipment (this factor is blamed for around 30 percent of the disruption in the start-up program). At the same time, the machine building industry is fulfilling its plan for the production of primary machines and equipment--technological, power equipment, and automatic production lines. The construction warehouses contain above-norm reserves of equipment, including imported equipment. These reserves are not being reduced, but rather are increasing in the course of time.

It is believed that almost 10 percent of the scheduled times for operational introduction of capacities and fixed capital are disrupted due to lack of provision with projects and estimates. At the same time, the project design organizations are not only fulfilling, but even overfulfilling their plans for project-survey work. Documentation whose cost is figured in hundreds of millions of rubles is lying on the shelves of these organizations with no application. In recent times, 200-300 million rubles worth of project documentation has been written off annually as being unneeded and worthless.

All this leads to the conclusion that the organizational forms of construction administration and management as they have been formulated do not perform their primary function in full measure. That is the provision for development of the end product.

The basic directions for economic and social development of the USSR for the 11th Five-Year Plan and for the period to 1990 adopted by the 26th CPSU Congress provide for the implementation of measures on improving the organizational structure of management, as well as the style and methods of work.

The resolution by the CPSU Central Committee and the USSR Council of Ministers on improving the economic management mechanism (1979) obliges the ministries and departments to develop and introduce a system of managing capital construction based on two- and three-segment levels of management. The primary task of the contracting organizations is to fulfill the tasks of the start-up program, and not simply the gross volume of construction-installation work, as has been the case in the past (in connection with this the submission of the end product has been moved back to secondary importance).

Important prerequisites for the implementation of the positions presented by the 26th CPSU Congress have been outlined in the resolution of the CPSU Central Committee and the USSR Council of Ministers entitled "On Improving the Planning, Organization and Management of Capital Construction," adopted in 1984. This resolution provides, among other measures, for increasing the role of the construction-installation trusts (production construction-installation associations or other organizations equated to the trust) as the primary cost accounting segment in managing building production. Therefore, it is necessary to resolve a number of pressing questions, and primarily that of the minimal annual volume of contract work for the trusts (production associations). Practical experience has shown that this volume should expediently be set within the limits of 40-50 million rubles, with the maximal volume reaching 100 million rubles or more. Furthermore, it is necessary to provide the necessary prerequisites for increasing the specialization of building production.

As a rule, provision is made for including construction-installation subsections, production-technological complementation administrations, and other subsections, depending on the specifics of work performed by the trust, into the make-up of the trust as production units. The trust is provided with the necessary means of mechanization and transport by means of supplying its subsections or by means of subordinating to it organizations which specialize in this sphere and which are within the jurisdiction of the ministries and main territorial administrations on construction. In this case, the work of the indicated organizations must be evaluated based on the end results of building production.

According to the resolution, the trust managers bear the responsibility for the timely operational introduction of production capacities and facilities, for the fulfillment of construction-installation work in accordance with the integrated schedules, for fulfillment of tasks on growth in labor productivity, for profits and reduction in production cost of construction-installation work, and for adherance to other technical-economic indicators. In the development of these and other positions, provision has been made for developing a program for further improving the basic aspects of construction work. At present, the elimination of the multi-stage character in the management of capital construction and the transition in 1984-1985 to a two- or three-segment system of management is being brought to the forefront. In the course of this work it is expedient to take not only the trusts as the cost accounting units, but also other organizational forms of management which are similar to the trusts or which perform their functions. Thus, life is posing the question of creating complexes (production associations) such as those operating in industry, whose rights are somewhat broader than those of trusts. During the period of 1980-1982, 206 such production construction-installation associations have been created, and are performing slightly more than 11 percent of the overall volume of contract work.

As an example to illustrate their differences from trusts, we may site the Kaliningrad Production Association of the USSR Ministry of Construction, which includes within its make-up 4 SMU [construction-installation administrations], 12 mobile mechanized columns, a DSK [house-building combine], a mechanization administration, a UPTK [production-technological complementation administration], a motor pool, the Orgtekhstroy Trust, and several industrial enterprises. Such integration has made it possible to bring management closer to the primary organizations and to liquidate parallelism. It has ensured the most complete utilization of capacities of all subsections, provided conditions for the introduction of the brigade order on a large scale, and ensured improved material-technical provision and plan balance. In 1982, all the production capacities and facilities of social-cultural function were placed into operation, and the plan for introduction of housing was overfulfilled. The number of building sites under simultaneous construction was reduced from 315 in 1978 to 179 in 1982. At the same time, there was a significant increase in the volume of construction-installation work. In 1982 alone, the labor productivity of builders increased by 2.6 percent, and above-plan profits were realized.

In accordance with the resolution of the CPSU Central Committee and the USSR Council of Ministers on improving the economic management mechanism, in 1981 the transition was completed on submission of commodity building production by contractors to their customers. The resolution further found it expedient to gradually introduce the construction of enterprises (structures) "under key" in individual sectors of the economy and in industry.

The essence of the question in the first as well as in the second case consists of ensuring the operational introduction of production capacities and fixed capital. However, under the conditions of developing commodity building production, the functions of placing orders for the manufacture and delivery of equipment, its acceptance and partially (and sometimes even primarily) the organization of its installation remain in the hands of the enterprises placing

the orders. However, in submission of the enterprises (structures) "under key", these responsibilities are placed on the contractors. This is a radical turn in the direction of comprehensive resolution of the central problem in the building industry.

A convincing example of the method of work by the "under key" method may be the building organizations which have fully changed over to the block-assortment method of building many structures in pipeline transport. The block-assortment installations are finished pumping, compressor, or re-pumping stations, boiler rooms and other facilities for product lines. The equipment is installed in blocks which are plant manufactured. The blocks and sets of future facilities are delivered to their point of destination from the plant. Here, they are installed by a work brigade sent from the plant on foundations which have been prepared ahead of time. After acceptance, they are submitted to the customers in a form ready for operation. A special association has been formed for performing this work. Undoubtedly, the possibility of reorganizing construction-installation organizations into such associations exists also in other sectors.

For many years, the organizations of all ministries and departments, as well as the local Soviets of People's Deputies, performing residential-civil construction have been submitting finished production to the customers. These are residential houses and other facilities, and are submitted in accordance with the acts of state acceptance commissions ratified by the appropriate ministries or ispolkoms of the Soviets of People's Deputies. This is one of the reasons why the assignments for operational introduction in this sector are being realized better than in industrial construction.

In creating facilities "under key," the contractor submits the finished product and is responsible to the consumer (customer) for its technical level as well as for its cost.

We must remind the reader that in a number of cities, plant-building combines (ZSK) were formed in the sixties. They operated according to the following scheme: manufacture of constructions, their delivery to the building site, construction of industrial buildings. As concerns the installation of equipment and other expenditures associated with the operational introduction of the capacities, these were performed by other organizations or by the customers themselves. Consequently, the plant-building combines did not produce finished products. They were gradually reorganized into ordinary enterprises supplying reinforced concrete products. These were, as a rule, large production units which were expediently created wherever there was the need to transform them into enterprises operating on the principles adopted for the DSK.

The resolution entitled "On Improving Planning, Organization and Management of Capital Construction" considered it expedient for purposes of further improving the economic management mechanism in construction, to implement the experimental construction of a number of production facilities, residential houses and facilities of social-domestic function beginning in 1985 according to projects and estimates coordinated between the customer and the contractor, and with "under key" submission of facilities prepared for product output. The difference between the estimated and actual cost serves as profit for the contracting

organizations. The experiment is being conducted at several glavks [main administrations] of general construction ministries and at two BSSR building departments*. It is understandable that this should give a decisive impetus to the overall introduction of the indicated progressive method. As for residential-civil construction, the only question remaining here is on the transfer of responsibilities on ordering equipment and organizing its installation to the contractors and on clarifying the order of coordinating project-estimate documentation.

The question of improving the organization of equipment deliveries, its installation and operational introduction is rather current. In the 9th Five-Year Plan, the Ministry of Chemical and Petroleum Machine Building changed over from deliveries of equipment "piecemeal" to the provision of construction sites with complete technological lines, acting in the role of the general supplier. The Ministry supplies enterprises which are under construction with complete sets of equipment of high plant readiness (including apparatus, mechanisms and instruments supplied by other sectors). Computations show that with this organization of provision of equipment and other technology to facilities under construction, the economic effect in the national economy comprises (on the average per year) 200-300 million rubles.

However, the experience of Minkhimmash has turned out to be economically incomplete in some respects. The fact is that the evaluation of fulfillment of the plan for realization, the computation of profits, and the formulation of economic incentive funds by the supplier plants is done not in the course of completing delivery of the sets, but in the course of delivering the equipment included in these sets, i.e., piecemeal. The plants do not undertake the installation of equipment at the facilities which they have outfitted. Since the system of realization of equipment has not undergone any changes, it is understandable that the influence of the economic management mechanism on accelerating and improving the deliveries, complementation, and installation of equipment remains insufficient.

The facts and considerations which have been presented stress the vital importance of the task set forth by the 26th CPSU Congress: to ensure the delivery of complete sets of equipment with high degree of plant readiness to the consumer, to ensure performance of installation work, start-up operations and submission of this equipment to the customer by the machine building enterprises and associations. It was also recommended to the equipment manufacturers that they take on the company servicing of the machine systems which have been introduced into operation. Then the machine building associations and enterprises supplying the complete sets of equipment will become general contractors on fulfilling the program of technical re-tooling and reconstruction of existing enterprises which, of course, does not exclude their participation in new construction as well.

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* Many organizations within specialized construction ministries (agricultural construction, the gas and petroleum industry) are already implementing this order.

Undoubtedly, such expansion of the responsibilities of equipment suppliers turns many contracting organizations into subcontractors fulfilling the necessary construction work for the supplier plants, improves the supply of equipment to construction sites, and eliminates the future need for the cumbersome system of main complements. At the same time, the supplier plants turn into organizations of the industrial-construction firm type. There are already a number of enterprises which are operating on these principles. However, they are still singular examples.

An important step in this matter is the realization of the position stated in the resolution of the CPSU Central Committee and the USSR Council of Ministers entitled "On Improving Planning, Organization and Management of Capital Construction." According to this resolution, equipment suppliers must ensure strict adherance to time schedules for the manufacture and complete set delivery of equipment to the construction site, as well as the implementation of control assembly of complex equipment, participation in major installation, start-up operations, and bringing the technology to its project capacity. The USSR Gosplan [State Planning Committee], the USSR Gossnab [State Committee for Material and Technical Supply], and the USSR Gosstroy [State Committee for Construction Affairs], with participation of the machine building ministries, are preparing directives and order of implementation of this work. Preferably these will give consideration to the fact that payment is currently being made not only to contractors performing major installation, but also assembly. Otherwise, those who have gone ahead will have to retreat, and their experience will be rewarded and promulgated.

Another question which is being discussed (including also in the press) is that of transforming (at first on an experimental basis) several scientific-research institutes operating within the construction sector into project-engineering firms which would correspond approximately to the scientific-production associations operating in industry. Aside from having building organizations, these firms should have their own start-up and adjustment organizations, and they must bear the full responsibility for scientific-research, experimental design work, for project planning, construction and operational introduction of the production capacities, including their assimilation. Thus, the project planning organizations turn into the leading participant in the investment process, responsible for ensuring the fulfillment of project decisions. In Moscow, the project planning-construction association in Chertanov is already successfully implementing production activity. There is also a similar organization in Leningrad as well as in a number of other rayons. Often the DSK are assigned project planning subdivisions, which often serve as their head. A clear example of this is the well-known Orlov continuum.

Undoubtedly, in considering the operational experience of this type of organization in examining the schemes of construction management worked out by the ministries, it is necessary to provide for strengthening of the existing and creation of new organizations on the basis of ordinary construction-installation subdivisions wherever this is economically justified. The types of listed organizations should be set up in such a way as to give maximal consideration to the specific peculiarities of sectors of the national economy and industry, to individual types of production, to economic regions, to sectorial territorial-

production complexes, and to the technological and reproductive structure of capital investments. We must note that the search for and introduction of innovations in this field answers the directive of the 26th CPSU Congress regarding the fact that it is impossible to adapt a living and developing organism of economic management to stabilized and customary forms. On the contrary, the forms must be presented in accordance with the changing tasks.

Construction-installation trusts (production associations) must first evidently work with the output of commodity building production as their basic task, and then gradually to change over to submission of products "under key." As concerns the other forms of organization of building production and construction management, these must from the very beginning orient their activity to work "under key" and to the output of "finished production," which presupposes technical servicing of the created fixed production capital in the process of its operation.

12322
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INDUSTRIAL CONSTRUCTION

INDUSTRIAL CONSTRUCTION IN FAR EAST REORGANIZED

Moscow PROMYSHLENNOYE STROITEL'STVO in Russian No 10, Oct 84 pp 4-6

[Article by P.I. Shtitel'man, candidate of technical sciences and deputy director of Dal'nevostochnyy Promstroyniiproyekt (Far Eastern Scientific Research and Planning Institute of Industrial Construction): "Regional Standardization--the Way to Production Mastery of Industrial Construction Systems in the Far East", under the rubric "As a Matter for Discussion"]

[Text] The tasks set in the decisions of the 26th CPSU Congress for accelerated development of our country's eastern regions require not only intensive efforts on the part of the builders in fulfilling the national economic plans, but at the same time they require that particular care be taken to develop a modern industrial construction base ahead of schedule in places where conditions are challenging [1].

Standardization forms the basis for industrializing the USSR's commercial construction. The development of this standardization has also found embodiment in the regions of the Far East for which, using the system set up by USSR Gosstroy [State Committee for Construction Affairs], Dal'nevostochnyy Promstroyniiproyekt and Khabarovskpromproyekt [Khabarovsk Industrial Planning Association] have developed and are constantly updating the territorial constructional catalogs, keeping in mind Minvostokstroy's [Ministry of Construction in the Far East and Transbaykal Regions] potentialities. The work of the territorial institutes is closely related to a range of current standardization-related problems which have been more fully elucidated by Doctor of Technical Sciences Yu. N. Khromets and other coworkers from TsNIIpromzdaniy [Central Institute for Scientific Research and Experimental Design for Industrial Buildings and Structures] [2, 3, 4].

Speaking of the special features of this new stage of industrial construction, the authors have come to the conclusion that at present the ongoing development of the construction industry's production methods and types of buildings and structures is a determining factor, and that a new, more vital requirement is "to have a more flexible approach to standardization, one that makes growth possible for the industrial base as well as the industry's output"[2].

A proposal has been made to adopt, as a basic standardizing trend, the organization of a multilevel system in which, along with the traditional concerns of standardization such as size and load parameters and three-dimensional layout and design resolutions), these unified principles will be made part and parcel of the buildings' engineering provisions as well as part of the construction processes.

We have drawn up a table which is of some practical interest regarding the levels of standardization and the forms taken by the resolutions, which can be referred to as "standardizing matrixes", wherein a specific result is shown for each level, the result classified as for standardization, planning and production of items and construction [3]. One feature of this new developmental plateau is also evident in the fact that we have observed "an overall transfer of the problem of boosting series production of plant-manufactured products from the all-union level to the next levels of standardization, i.e., to the territorial and area-wide levels, which allows the potential of the industrial base to be taken into account" [3]. This trend has been found to be correct in principle. However, the formulation of this particular problem, as well as a number of other problems of the multilevel standardization structure, needs to be precisely defined, as it contains objective discrepancies, brought about as a result of the variance of the specific goals and the scale of the tasks. It might be particularly worthwhile to mention that at the construction industry's present-day stage of development, no universally recognized criteria have been elaborated which would make it possible to evaluate the most favorable stage at which to standardize these resolutions.

Таблица 1

(1) Факторы	(2) Белорусская ССР	(3) Приморский край	(4) О-в Сахалин
a Площадь территории, тыс. м²	208	166	76
b В том числе с сейсмичностью:			
c 6 баллов, %	0	43	31
d 7 баллов, %	0	9	69
e Изменение средней температуры наиболее холодных суток по районам, °С	От —24 до —26° (2°)*	От —22 до —35° (13°)	От —14 до —38° (24°)
f Снеговые нагрузки, район/вес снегового покрова, кгс/м²	I/50 II/70	I/50 II/70 III/100 IV/150	V/200 VI/250
g Ветровые нагрузки, район/скоростной напор, кгс/м²	(20) I/27 (0)	(100) III/45 IV/55 V/70 VI/85 VII/100 (55)	(50) III/45* IV/55 V/70 VI/85 VII/100 (55)

Table 1.

Key: (1) Factors: a--Area of territory, 1000's m^2; b--including areas having a seismicity of: c--force 6, %; d--force 7, %; e--Temperature variation for the regions' coldest days, °C; f--snow loads, area/weight of snow cover, kg-force/m^2; g--wind loads, area/velocity head, kg-force/m^2; (2) Belorussian SSR; (3) Maritime Kray; (4) Sakhalin Island; *--factor variation range, by region.

It would seem a good idea to bring the discussions of a number of the deliberations concerning construction in the Far East into order.

Minvostokstroy's construction and planning organizations operate over a vast area (about 40 percent of the USSR's Asiatic part). The Yakut ASSR, a considerable portion of the Buryat ASSR, and the Chita, Magadan and Amur Oblasts of the Khabarovsk Kray are all part of the Northern climate construction zone which has low temperatures during the cold period of the year. They are also part of the regions where permafrost, in its varying manifestations, is found. Without touching upon the specifics of standardization connected with this, or the particular conditions of the Kamchatka Oblast (a seismicity of up to force 9, high snowdrifts etc.) we shall discuss only the Maritime Kray and Sakhalin Island. Their total area amounts to 242,000 km^2 and is comparable in size to the Belorussian SSR.

Let us compare the parameters of the effects and loads which are dependent on natural data (Table 1). It is apparent that even where conditions are more favorable than in the North, it is necessary to pick out separate areas within each administrative rayon of the Far East,in contrast to the European part of the country where, within the boundaries of one or several republics the range of alteration of the loads and effects are so negligible as to be practically inconsequential. Let us add that a number of the construction sites in the Maritime Kray and on Sakhalin Island are situated in hard-to-reach areas with only seasonal operation of water and motor transport.

TsNIIpromzdaniy stresses that the commercial production of various types of light-weight metalwork (structures, trusses, girders and frames), which production was establishd in the 70's, should meet the demands of remote and hard-to-reach areas [2]. The volume of LMK [light-weight metalwork] KP [not further expanded] being used by Minvostokstroy is greatly increasing. However, about 50 percent of this is being used to make the volume complete by 1985, since the standard designs included in the all-union catalog are not suitable for the conditions in many of the Far East's regions. Enterprises of the Soyuzspetslegkonstruktsiya [All-Union Special Light-Weight Construction] VPO [All-Union Production Asociation] are not producing complete sets of structures suitable for northern climate construction areas where the temperatures drop to -65° C, or structures suitable for areas with above-average snow loads combined with Force 7 (and higher) seismicity, or for the Pacific coast's above-average wind loads.

On the instructions of USSR Gosstroy, where the resolutions of the Applied Sciences Conference on Light-Weight Metalwork KP, held in Khabarovsk in 1983, were considered, Dal'nevostochnyy Promstroyniiproyekt completed its determination of the optimum LMK assortment for each area of the Far East and the Transbaykal. This effort was methodically grounded on principles set forth by TsNIIpromzdaniy [2, 3]. It was found necessary here to introduce a number of refinements into the standardization matrix, which are related to the search for solutions to the practical problems of LMK KP as well as to the prospective industrial construction systems which use precast ferroconcrete.

The introduction of a level of zonal standardization, and the resolutions on transport which allow a more precise determination of the objectives and tasks, and which take the challenging construction conditions into account, are considerably different from the proposed version of the matrix (Table 2).

Proceeding from the proposition that "sectoral standardization of resolutions applies to projects specifically related to construction in a given sector of industry (ferrous metallurgy, heavy mechanical engineering, electric power engineering) and of agriculture and the area of maintenance" TsNIIpromzdaniy is making provision for the development of sectoral products lists of type sizes and designs, the results of which are the catalogs of sectoral industrial construction systems [3]. It is impossible to concur with this approach, as it carries on outdated traditions which are repudiated these days in standard design. Practice has shown that sectoral type plans do not take regional special construction features into account. During type-design tie-in, the design resolutions developed in detail in these sectoral type plans are completely transformed, since they contain a great many items which are not included in the territorial catalogs. Many of the type-designs recommended for high-volume use in the "Construction" Sector do not permit the use of light-weight metalwork or industrial plates "in the span" [5]. This is also typical of garages and other technical services buildings used in the various industrial sectors of the Far East. The type-design resolutions produced by the sectoral institutes are not coordinated among themselves and generate conflicts when the structures are being built.

The matrix structure proposed by our institute is based on the results of studying the contrast of the tendencies which have shown up in the multi-level standardization, and in the differences in the objectives, the scale of the tasks and the criteria for the most favorable resolutions.

Let us consider the three levels which have the most telling effect on the final results of production, i.e., the III, IV, and V levels (see Table 2). The main trend on the sectoral level of standardization is the insuring of a rational volumetrically-systematized arrangement of buildings and structures, in keeping with the functional purposes of the facilities of a given industrial sector, an agricultural enterprise, an area of maintenance etc. The main objective is to achieve the highest degree of efficiency for the enterprise under construction. The scope for the standardization of these groupings is on the all-union or republican level. The search for criteria which define the most favorable standardizing resolutions is carried out in the realm of the operation of similar enterprises of a given sector by setting up a system of evaluation which is based on the experience of both domestic and foreign science and practice.

The main trend on the regional level is toward all round (intersectoral and interspecific) utilization of the designs provided for any of the one-story or multi-story building models. The trend is also toward structures with the most complete possible compatibility of the designs and the construction methods with the specific conditions of the particular construction area. The goal is to complete construction in the shortest possible time with minimum

resource outlays. The scope of the problems' solution is within the region's boundaries. The criterion for the best standardizing solutions is sought in the area of increasing the efficiency of production in construction and installation work in correlation with advanced domestic and foreign experience.

(B) Уровни унификации	(A) Виды унифицированных решений						(I) Результаты унификации
	(C) Строительные параметры и нагрузки	(D) Типы объемно-планировочных и конструктивных решений зданий	(E) Типы несущих и ограждающих конструкций	(F) Системы инженерного обеспечения зданий	(G) Строительно-технологические процессы	(H) Транспортные схемы и процессы	
	1	2	3	4	5	6	7
I Основные положения общесоюзной унификации	Размерные модули. Градации основных строительных параметров	Принципы компоновки и конструирования зданий	Принципы формирования конструктивной формы	Принципы производства оборудования и коммуникаций Системы инженерного обеспечения зданий	Прогрессивные принципы строительной технологии	Принципы транспортировки строительных конструкций и изделий	ГОСТы и другие нормативные документы
II Унификация индустриальных систем	Градации основных строительных параметров и нагрузок (габаритные схемы)	Типы объемно-планировочных и конструктивных решений	Особенности конструктивной формы. Номенклатура типоразмеров конструкций и узлов их сочленений	Градации параметров помещений, шахт, каналов, коридоров для инженерного обеспечения зданий	Принципиальные технологические схемы изготовления, поставки и монтажа конструкций	Особенности транспортировки и хранения изделий. Требования по контейнеризации и специализированным транспортным средствам	Общесоюзный каталог индустриальных строительных систем
III Унификация отраслевых индустриальных строительных систем	Габаритные схемы	Особенности компоновки и конструирования зданий. Типы объемно-планировочных и принципиальных конструктивных решений	Особенности конструктивной формы. Номенклатура типоразмеров специальных изделий	Системы инженерного обеспечения зданий	Технологические схемы изготовления, поставки и монтажа специальных изделий	Особенности транспортировки и хранения специализированных конструкций и элементов оборудования зданий	Каталоги унифицированных отраслевых строительных заданий
IV Территориальная унификация	Габаритные схемы зданий	Особенности компоновки и конструирования зданий. Типы объемно-планировочных и конструктивных решений	Особенности конструктивной формы. Территориальная номенклатура типов и типоразмеров конструкций	Особенности систем инженерного обеспечения зданий. Типы блочных комплектов оборудования	Принципиальные технологические регламенты поставки и монтажа конструкций, подготовительных работ	Принципиальные регламенты транспортировки конструкций и элементов оборудования	Территориальные каталоги изделий индустриальных строительных систем
V Зональная унификация	Габаритные схемы зданий с зональной градацией нагрузок	Особенности компоновки и конструирования зданий, типы объемно-планировочных и конструктивных решений	Особенности конструктивной формы, зональная номенклатура комплектов конструкций, включая элементы нулевого цикла	Особенности систем инженерного обеспечения. Типоразмеры блочных комплектов инженерного оборудования	Технологические схемы монтажа комплектов конструкций и оборудования, подготовки нулевого цикла	Транспортные схемы перевозок. Технические схемы погрузки в транспортные средства	Зональные каталоги комплектов конструкций
VI Площадочная унификация	Объемно-планировочные параметры и нагрузки	Объемно-планировочные и конструктивные решения зданий и сооружений	Комплекты конструкций зданий, сооружений и элементов нулевого цикла	Системы инженерного обеспечения с блочными комплектами оборудования	Основные положения строительного проектирования	Схема перевозок. Технические схемы погрузки и складирования	Часть проекта «Общеплощадочная унификация зданий и сооружений»

Table 2.

Key:

(A)--Types of Standardizing Resolutions
(B)--Standardization levels
(C)--Construction parameters and loads
(D)--Types of volumetric-arrangement and design resolutions for buildings
(E)--Types of supporting and enclosing structures
(F)--Utilities systems for buildings
(G)--Construction methods
(H)--Transport plans and processes
(I)--Results of Standardization
(Key continued next page)

(Key, continued)

I--Basic positions on all-union standardization
II--Industrial systems' standardization
III--Standardization of sectoral industrial construction systems
IV--Territorial standardization
V--Regional standardization
VI--Standardization by site

I/1--Size-graded modules. Gradation of basic construction parameters
I/2--Layout and design principles for buildings
I/3--Principles used in the shaping of a design mold
I/4--Principles of production of utilities equipment and lines
Engineering support systems for buildings
I/5--Progressive principles of construction technology
I/6--Principles for transporting construction structures and articles
I/7--GOST's [All-Union State Standards] and other standardizing documents

II/1--Grading of basic construction parameters and loads (dimensional diagrams)
II/2--Types of volumetric arrangement and design resolutions
II/3--Special features of the design mold
Products list of type sizes and assemblies used to join them
II/4--Gradation of parameters for rooms, shafts, conduits and corridors for the provision of the buildings' engineering facilities
II/5--Principle flow-sheets for the manufacture, delivery and installation of structures
II/6--Special features of transporting and storing products.
Requirements for containerization and specialized transport equipment
II/7--The All-Union Catalog of Industrial Construction Systems

III/1--Dimensional diagrams
III/2--Special features of product arrangement and design.
Types of volumetric-layout, and fundamental design resolutions
III/3--Special features of design molds
Territorial products list of type sizes for special articles
III/4--System for providing buildings' utilities
III/5--Flow-sheets for manufacturing, delivery and installation of special items
III/6--Special features of transporting and storing special-purpose structures and elements for equipping buildings
III/7--Catalogs for standardizing sectoral construction assignments

IV/1--Buildings' dimensional diagrams
IV/2--Special layout and design features of buildings
Types of volumetric-layout and design resolutions
IV/3--Special design mold features
Territorial products list of design types and type sizes
IV/4--Special features of buildings' utilities systems
Types of unitized equipment sets
IV/5--Basic technological regulations for delivery and installation of structures, and for preparatory operations

IV/6--Basic regulations for transporting structures and equipment elements
IV/7--Territorial catalogs of industrial construction systems products

V/1--Dimensional building diagrams, with loads graded by region
V/2--Special layout and design features of buildings, and types of volumetric-layout and design resolutions
V/3--Special design mold features and a regional products list of sets of designs, including zero-cycle elements
V/4--Special features of utilities systems
Type sizes of unitized sets of engineering equipment
V/5--Flow sheet for installing sets of structures and equipment, and preparation of the zero cycle
V/6--Freight transport programs
Technical diagrams for loading into transport equipment
V/7--Regional catalogs of sets of structures

VI/1--Volumetric-layout parameters and loads
VI/2--Volumetric-layout and design resolutions for buildings and structures
VI/3--Sets of designs for buildings, structures and zero-cycle elements
VI/4--Utilities systems with unitized sets of equipment
VI/5--Basic positions on construction planning
VI/6--Freighting program
Technical loading and warehousing diagrams
VI/7--Part of the "Area-wide Standardization for Buildings and Structures" Plan

At the territorial level of standardization, the main trend is toward rationally organizing the completion of sets of and the manufacture of products which will meet the regional demand, according to the availability of resources, for the operation and viability of a given territorial production construction system. The main objective is to get facilities into operation ahead of schedule [1]. The scale for completion of the tasks is within the boundaries of a given territorial administrative-economic area. Criteria for the best solutions for standardization are being sought in the realm of smoothly maintaining a balance: the demand of construction projects for complete deliveries of structures, and the utilization of capacities for manufacturing the articles. This is achieved by minimizing the products list of full assortments, as well as the products list of the items making up the full assortment. Special mention should be made of the fact that each territorial construction system in the Far East and the Transbaykal region operates in the unique conditions of its region. Regarding the difficulty of finding any sort of similarity, the quest for criteria for the most favorable standardizing resolutions here must proceed only in comparison with the previous construction experience of the given region. The boundaries delimiting the scale of workable problems depend on the operational radius of the enterprises which are producing articles via a specific industrial construction system. In the conditions of the Far East, these boundaries for systems based on the use of precast ferroconcrete as a rule, coincide with the boundaries of the individual territorial regions or zones within them. For systems which are based on the use of metalwork, the scale of the tasks is expanded out to the overall boundaries of the activity of Minvostokstroy as a whole, and have led to a resolution on accelerating the building of a plant in the area for production of complete sets of LMK, and this takes the specific nature of each zone of the Far East and the Transbaykal into consideration [1].

The main feature of this new stage of development of construction in the Far East is the fact that the general contractor is striving to utilize all his resources in the area of effecting the design, and construction and production resolutions, and to put the resources of scientific and technical achievements into effect, in the present introduction of which he is not only an interested party, but for which he also bears complete responsibility to the government [1].

In the standardization matrix, which is guided by the principle of the separation of responsibility, a proposal has been made to limit the sectoral level by Result No III/7--the catalogs of standardized, sectorally constructed buildings (see Table 2).

The resolutions for intersectoral industrial construction design systems, construction and technological processes, and transport programs with the results presented in the form, respectively, of catalogs of regional assortments of structures and territorial catalogs of articles of industrial construction systems, should be adopted at the regional and territorial levels. This will serve as a guarantee of accelerated productive assimilation of the new effective designs to be used in construction in the challenging conditions of the Far East.

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12659
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HOUSING CONSTRUCTION

AGGREGATE HOUSING CONSTRUCTION FIGURES BY CITY

Moscow VESTNIK STATISTIKI in Russian No 11, Nov 84 p 65 , 75

[Statistical Table of residential construction by city, from 1983]

[Text] STATISTICAL DATA

Table 3. RESIDENTIAL CONSTRUCTION IN 1983

	(1) Построено квартир государственными и кооперативными предприятиями и организациями, населением и колхозами		(3) Построено квартир на 1000 человек естественного прироста населения, единиц
	(2) количество квартир, тыс.	их общая площадь, тыс. м²	(4)
a СССР	2 030	112 444	790
b в том числе по городам:			
c Алма-Ата[1]	10,8	513,1	1 167
d Ашхабад	2,1	148,4	427
e Баку[1]	10,9	600,7	558
f Вильнюс	4,6	238,8	942
g Горький	11,7	566,2	2 018
h Душанбе	3,8	173,3	472
i Днепропетровск	12,2	585,3	1 942
j Донецк	6,7	385,6	1 486
k Ереван	7,1	434,3	478
l Казань	8,3	435,8	1 201
m Киев	25,8	1260,1	1 200
n Кишинев	5,2	261,6	643
o Куйбышев	9,8	470,7	1 803
p Ленинград[1]	32,4	1635,7	2 755
q Минск[1]	15,4	803,7	720
r Москва[1]	59,3	3342,6	2 809
s Новосибирск	10,8	562,2	1 068
t Одесса	7,8	377,8	2 476
u Омск	10,5	584,4	939
v Пермь	7,4	365,1	1 001
w Рига	6,1	355,7	2 111
x Свердловск	11,4	607,1	1 257
y Таллин	5,4	272,5	2 230
z Ташкент	21,2	826,2	960
aa Тбилиси	10,1	588,7	1 172
bb Фрунзе	3,8	198,5	664
cc Уфа	6,8	353,2	706
dd Харьков	13,2	670,5	1 894
ee Челябинск	8,4	427,8	955

ff[1] Включая городские поселения, подчиненные горсовету.

Key for Table 3:

(1) Apartments constructed by state and cooperative enterprises and organizations, and by the populace and kolkhozes
(2) Number of apartments, 1000's
(3) Apartments constructed per 1000 persons of natural population growth, units
(4) Apartments' total area, 1000 m^3

a--USSR
b--including, by city:
c--Alma-Ata
d--Ashkhabad
e--Baku
f--Vilnius
g--Gorkiy
h--Dushanbe
i--Dnepropetrovsk
j--Donetsk
k--Yerevan
l--Kazan
m--Kiev
n--Kishinev
o--Kuybyshev
p--Leningrad[ff]
q--Minsk[ff]
r--Moscow [ff]
s--Novosibirsk
t--Odessa
u--Omsk
v--Perm
w--Riga
x--Sverdlovsk
y--Tallin
z--Tashkent
aa--Tbilisi
bb--Frunze
cc--Ufa
dd--Kharkov
ee--Chelyabinsk
ff--Including urban settlements subordinate to the city soviet

Table 4. Urban Housing Resources to the End of 1983

(1)	Тысяч квадратных метров общей (полезной) площади жилищ	(1)	Тысяч квадратных метров общей (полезной) площади жилищ
a СССР	2 416 459	p Ленинград	79 111
b в том числе по городам:		q Минск	19 712
c Алма-Ата	13 872	r Москва	141 368
d Ашхабад	3 673	s Новосибирск	17 777
e Баку	18 478	t Одесса	14 422
f Вильнюс	7 530	u Омск	14 540
g Горький	19 813	v Пермь	13 236
h Днепропетровск	16 765	w Рига	14 108
i Донецк	15 673	x Свердловск	18 045
j Душанбе	5 927	y Таллин	7 798
k Ереван	13 184	ž Ташкент	21 501
l Казань	13 690	aa Тбилиси	15 970
m Киев	36 306	bb Уфа	12 363
n Кишинев	7 507	cc Фрунзе	7 003
o Куйбышев	17 025	dd Харьков	22 035
		ee Челябинск	15 170

Key:
(1) 1000's square meters of total (usable) residential area

a--USSR
b--including, by city:
c--Alma-Ata
d--Ashkhabad
e--Baku
f--Vilnius
g--Gorkiy
h--Dnepropetrovsk
i--Donetsk
j--Dushanbe
k--Yerevan
l--Kazan
m--Kiev
n--Kishinev
o--Kuybyshev
p--Leningrad
q--Minsk
r--Moscow
s--Novosibirsk
t--Odessa
u--Omsk
v--Perm
w--Riga
x--Sverdlovsk
y--Tallin
z--Tashkent
aa--Tbilisi
bb--Ufa
cc--Frunze
dd--Kharkov
ee--Chelyabinsk

III. Average Construction Costs for Housing and Cultural-Domestic Facilities Derived from State Capital Investments in 1983.

	Average construction cost, rubles
Residential Homes--1 m^2 of overall area.	199
Non-specialized schools--1 student-place.	1,213
Pre-school institutions--1 place.	2,054
Professional-technical academic institutions--per student place. . .	2,469
Hospitals, per single bed.	8,911
Out-patient-polyclinic institutions--one visit per shift.	1,650

12659
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CONSTRUCTION MACHINERY AND EQUIPMENT

INTRODUCTION OF MORE, IMPROVED CONSTRUCTION MACHINERY VIEWED

Moscow MEKHANIZATSIYA STROITEL'STVA in Russian No 12, Dec 84 pp 4-6

[Article by A. V. Besschastnyy, State Construction-Installation Association No 1, Glavmospromstroy; V. A. Voloshin, USSR Gosstroy; V. V. Ruleva, Moscow House of Scientific-Technical Propaganda imeni F. E. Dzerzhinskiy; engineers: "Integrated Mechanization of Work and its Engineering Preparation"]

[Text] In June of 1984 the Moscow House of Scientific-Technical Propaganda imeni F. E. Dzerzhinskiy held a seminar on the subject of "Integrated Mechanization of Construction--Engineering Preparation". The participants in the seminar were specialists from the USSR Gosstroy Department of Mechanization and Automation of Construction, the construction ministries and departments, Mosgorispolkom [Moscow City Soviet], and scientific workers from TsNIIOMTP [Central Scientific-Research and Experimental Design Institute on Organization, Mechanization and Technical Aid to Construction],VNIPItruda [All-Union Scientific-Research and Design Institute on Labor in Construction] and VNIIAlmaz [All-Union Scientific-Research and Design Technological Institute on Natural Diamonds and Instruments].

N. D. Timofeyev, subsection chief of the USSR Gosstroy Mechanization and Automation in Construction Section, presented a brief overview of the basic directions in development and the tasks of integrated mechanization of construction work. He noted that the country has emerged at a decisive and extremely crucial boundary of the five-year plan. In the 3 years of the 11th Five-Year Plan, builders have made a significant contribution to the development of the national economy. In this period, fixed capital in the amount of 418.1 billion rubles has been introduced into operation, and over 300 million square meters of residential housing area has been built. The overall volume of fulfilled construction-installation work has exceeded 210 billion rubles.

A leading role in increasing the effectiveness of building production belongs to mechanization. The construction industry was supplied with 28,900 excavators, 28,500 bulldozers, 37,100 boom and tower cranes, 157,800 finishing machines, and 208,000 vibrators. The general pool of basic construction machines at present comprises 820,000 units. Over 1.2 million people are engaged in the operation and technical servicing of these machines.

The structure of the construction machine pool has also improved due to an increase in the delivery of new types of hydraulic cranes with telescoping booms and hydraulic excavators (whose relative share has increased to 43 percent of the total pool of these machines), hydraulic hammers for breaking up hard soil, plastering and painting installations, high pressure painting aggregates, impact-rotation electric perforators, and other means of mechanization.

The application of concrete pumping trucks and concrete mixing trucks has expanded in the production of concrete work, as has the application of special installations for placing bore-driven piles and structures by the "wall in the ground" method, as well as other machines which have made it possible to introduce new and improved methods of mechanized work production.

The construction ministries and departments have made a significant contribution to the development of mechanization in construction. Every year they manufacture machines, equipment and instrumentation worth over 1.5 billion rubles. Generally these are means of mechanization whose output has not been mastered by industry or has not been organized in sufficient quantities.

On the whole, due to mechanization of construction-installation work in 1981-1983, the labor consumption of construction-installation work in contract construction has been reduced by 182,000 persons. As a result of this, an increase in labor productivity of more than 2.7 percent has been attained.

At the same time, the state of affairs in the development of construction mechanization cannot be considered satisfactory and, as was noted at the April (1984) Plenum of the CPSU Central Committee, we cannot do "without further increase in the intensity of our economic management work."

The main question remains that of increasing the effectiveness of application of building technology and equipping the sector with modern and highly effective machines. The recent resolution by the CPSU Central Committee and the USSR Council of Ministers on improving the planning, organization and management of capital construction is also aimed at this goal.

The results of the first 3 years of the 11th Five-Year Plan indicate that the growth in productivity of basic construction machines is lagging behind the assignments set in the five-year plan, while for individual construction ministries there is even a reduction in their output. Construction machines are not satisfactorily used in terms of time. The average duration of the operation of construction machines per day comprises 10-12.5 hours. Extensive losses of machine time are associated with unsatisfactory intra-shift application of building technology, and comprise up to 16.1 percent.

The main reasons for unsatisfactory use of machines are the shortcomings in the organization and technological preparation for work production, late delivery of materials, parts and structures, and disruption of labor discipline. Machine idle times have increased due to erratic supply of fuel-lubricant materials and electrical energy.

The question of spare parts delivery remains acute, as well as that of supply of mobile means for technical servicing and repair of machines and unsatisfactory application of instrumentation and means of small-scale mechanization.

The speaker told of the basic directions in improving the application of the building technology pool in contract construction and in improving planning and mutual relations between the mechanization subsections and the building organizations. It was noted that there are cases where the order of formulation of the production program by mechanization trusts (administrations) is disrupted at the sites. The same principles of planning are applied to these specialized organizations as to general construction organizations. As a result, disruptions are permitted in establishing the labor indicators and assignments for reduction of cost of work performed. This has a negative effect on the level of application of building technology.

In order to regulate the questions of planning and mutual relations between the building organizations and mechanization trusts (administrations), the scientific-research institute on construction economics is presently developing a standard position which will provide for increased mutual interest on the part of the interested general construction and specialized organizations in improving the application of the machine pool and in reducing labor expenditures in construction.

It is also necessary to improve the economic mechanism of management, to regulate accounting for mechanized work performed, to introduce more broadly the progressive forms of labor wages for work of machines, their transport, technical servicing and repair, and to regulate the plan-accounting prices for application of technology.

An important condition in the effective application of construction machinery is the continued improvement in the organization of labor and introduction of progressive forms and methods of performing work.

Such an effective lever as the inclusion of machine operators in the make-up of building brigades is still insufficiently used. The practice of including machine operators and motor transport drivers in the make-up of integrated brigades operating according to a single order and survey area significantly increases their interest in the end result of the work and develops reciprocal cooperation. The best application of technology is achieved when it is concentrated in large mechanized brigades and links.

The effectiveness of construction mechanization depends in large part on the machine builders, and primarily on the Minstroydormash [Ministry of Construction, Road and Municipal Machine Building].

The currently existing structure of the construction machine pool does not meet the requirements of building production and hinders the growth of labor productivity. Thus, the relative share of bulldozers on 3 ton-class tractors must be 12 percent of the overall pool of these machines (in actuality it is 43.6 percent); of bulldozer-cultivators on 25 ton-class tractors -- 10.4 percent (in actuality it is 1.2 percent); of motorized cranes with 6.3 ton load capacity-- 15.4 percent (in actuality it is 55.5 percent); and of motorized cranes with

load capacity of 10 tons or more -- 84.6 percent (in actuality it is 44.5 percent). The situation is analogous also for tower and boom cranes, scrapers and other types of machinery. Specialists have computed that if the pool of machinery in construction is brought up to its optimal structure, the overall number of machines may be reduced by 99,200 units, and the number of machine operators may be reduced by 147,000 persons, all the while retaining the overall volume of performed construction work.

The machine building ministries and planning organs should review the plan for machine production, keeping in mind the goal of bringing the machine pool into line with its optimal structure.

Although the production of mechanized tools has expanded recently, nevertheless the need in construction for construction-finishing machines is satisfied only by 60.5 percent, and the need for mechanized tools -- by 48.1 percent.

Particular attention must be given to the mechanization of roofing, concrete, plastering and painting work, as well as work on installation of technological equipment and floor installation, where a significant amount of manual labor is still being used. The quality and technological capacities of construction machines should also be improved.

In connection with the increased volume of work performed in remote regions, the expenditures and time spent on re-basing construction machinery have increased. The solution to this problem is associated with the development of production of mobile construction machines, as well as portable means for technical servicing and repair. The design of cranes should be improved, particularly cranes for installation of tall buildings, in order to reduce the machine time for vertical transport. The movement of large volumes of dirt remains a serious problem. Because of the absence of large capacity dirt hauling trucks in construction, the duration of the preliminary period, as a rule, exceeds the time allotted by the schedule.

Construction needs more than just highly productive and reliable machines. They must be economical as well. Unfortunately, the cost of machinery is increasing at a more rapid rate than its productivity. Thus, while the pool of construction machines in contract construction has grown by an average of 10 percent during the years of the 11th Five-Year Plan, its balance cost has increased by 40 percent. At the same time, almost no increase was observed in unit machine capacity. The relative cost increase in the machine pool comprises 4-5 percent per year. This undesirable tendency leads to an increase in the cost of construction work and lowers the qualitative indicators of building organizations.

In resolving the problem of continued development and improvement of integrated mechanization of construction-installation work, machine operators must ensure the fulfillment of a basic task--to increase labor productivity in construction in the 11th Five-Year Plan by 4.6 percent due to the "mechanization" factor. The capacities for this do exist.

G. K. Maltyzov, chief project designer of Glavmosinzhstroy under the Mosgorispolkom, told in his report about certain small-scale means of mechanization developed at the special design bureau which are being widely used at the glavk construction sites.

In recent years, he noted, there has been a tendency in the USSR and the USA toward the development of universal road building machines. The characteristic indicator of these types of machines is that they are equipped with several operating accessories which are in constant work readiness. Also, they are most often equipped with interchangeable operating accessories.

The special design bureau has developed a set of suspended equipment for the T-25A tractor which consists of a bulldozer blade with folding forks, a bucket, a centrifugal pump for pumping water, and an installation for assembly and disassembly of hatches in inspection wells. The set of equipment is intended for earthwork, cargo handling and transport operations at urban construction sites. With the installation of the suspended equipment, the T-25A tractor becomes a universal road building machine. The series production of this equipment has been developed at the Glavmosinzhstroy Road Machine Repair Plant.

With application of the T-25A tractor with the set of suspended equipment at engineering construction sites in Moscow, the following types of work have been mechanized: transport and placement of curbstones, concrete, sand and rubble, building structures and parts (asbestos cement pipes, slabs) along the road; pumping water out of trenches, foundation pits and wells; grading sand, rubble and soil; collecting and hauling away building rubbish and waste; disassembly and assembly of inspection wells in the construction and repair of road surfacings.

Chief Engineer of the Odessa Construction-Finishing Machine Plant M. Yu. Bondar' told the seminar participants about the machines which his plant manufactures and about the crucial tasks facing the entire collective of workers and engineers at the plant. He particularly stressed the need for participation of builders in improving the design of machines manufactured by the plant, and particularly their effective application at building sites.

The plant has begun the series manufacture of new multi-speed portable machine tools IE-1801A and IE-1806 for drilling installation holes in reinforced concrete using diamond-tipped circular drills. The IE-1801A machine tool was awarded the gold and silver medals of the USSR VDNKh [Exhibition of USSR National Economic Achievements] at the international exhibit "Stroydormash-81".

The pneumatic punches developed by the USSR Academy of Sciences Siberian Division Novosibirsk Mining Institute and manufactured by the Odessa Plant are well known in this country and abroad. As we know, the application of pneumatic punches is particularly effective in trenchless placement of engineering communications. Nevertheless, despite the fact that the plant has produced tens of thousands of pneumatic punches of various models, their application is still limited. The reason for this is that cadres of workers are not being trained for qualified servicing of these machines. The concentration of pneumatic punches in specialized brigades and sectors--this is the effective means toward their widespread application in construction.

Examples of this are Glavnovosibirskstroy, which for many years has had a successfully operating specialized pneumatic punch section, and Glavmosprom-stroy, in which a sector for integrated application of pneumatic punches in

construction was created 5 years ago within the State Construction-Installation Association No 1. The scientific-technical cooperative of specialists GSMO-1 of Glavmospromstroy and the Odessa Construction-Finishing Machine Plant, as well as the scientists at the USSR Academy of Sciences Siberian Division Institute on Mining have confirmed the expediency of concentrating pneumatic punches within sectors on small-scale mechanization.

TECHNICAL-ECONOMIC INDICATORS OF THE COST-ACCOUNTING SECTOR AT MAJOR CONSTRUCTION SITES IN THE CAPITAL

1) Объект	2) Диаметр монтажного отверстия, мм	3) Глубина монтажного отверстия, мм	4) Общее количество просверленных отверстий, шт.	5) Суммарная длина просверленных отверстий, м	6) Экономия трудовых, материальных и энергетических ресурсов			
					7) Сокращение трудозатрат, чел.-ч	8) Электроэнергии, кВт·ч	9) Жидкое топливо, л	10) Пиломатериалы, м³
11 Завод «Серп и молот»	20—100	500	23 455	1173.5	10 118	604	6000	7
12 Автозавод имени Лихачева	20—160	350	45 416	1076.1	22 523	1211	10500	13.6
13 Автозавод имени Ленинского комсомола	20—160	480	14 486	5070.1	7177	453	3000	4.3

Key: 1 - Facility
2 - Diameter of installation opening, mm
3 - Depth of installation opening, mm
4 - Total number of drilled openings, units
5 - Overall length of drilled openings, m
6 - Economy of labor, material and energy resources
7 - Reduction in labor expenditures, man-hrs
8 - Electrical energy, kW·hr
9 - Liquid fuel, liters
10 - Lumber materials, m^3
11 - "Serp i molot" Plant
12 - Auto plant imeni Likhachev
13 - Auto plant imeni Leninskiy Komsomol

In his speech, GSMO-1 Chief Mechanic A. V. Besschastnyy also stressed the economic expediency of concentrating means of small-scale mechanization in specialized sectors, of utilizing integrated mechanization for labor-consumptive manual processes, and of providing for engineering preparation for production, keeping in mind the development of work production projects in which the optimal need for means of small-scale mechanization ensuring a tangible reduction in labor expenditures may be determined by computation based on the specific volumes and types of work.

Furthermore he reported to the participants that as early as the 60's, specialists at the Mosstroy-9 Trust (presently the State Construction-Installation Association No 1 of Glavmospromstroy), working in close cooperation with the scientists at VNIIAlmaz, employed the widespread use of diamond-tip drilling of installation openings in reinforced concrete at construction sites. They laid the groundwork for the intensive application of diamond instruments in construction and for the development of a new technology which has come to replace the traditional methods.

The many years of practical wide-scale application of diamond drills has confirmed the expediency of concentrating these instruments within specialized brigades and sectors. The GSMO-1 cost accounting sector of Glavmospromstroy has developed along an ascending line--from a large specialized brigade numbering 15 people to a sector having an independent balance and annual plan for construction-installation work in the sum of 1,300,000 rubles. This journal has already reported on the characteristic specifics of this sector.*

Diamond-tipped machine tools and installations are used most effectively in reconstruction and technical re-tooling (see Table).

On the proving ground of the cost-accounting sector, the seminar participants demonstrated the new machine tools of various designs in action. These machine tools make it possible to make practically all installation openings encountered in the practice of building production.

The new two-speed IE-1801A machine tool, which is series manufactured by the Odessa SOM Plant, attracted some attention. The main advantages of the IE-1801A machine tool as compared with the IE-1801 are: the weight is reduced to one-half that of the old model, the kinematics are improved, and the machine tool is equipped with a two-speed transmission.

TECHNICAL DESCRIPTION OF THE IE-1801A MACHINE TOOL

Drill diameter, mm:	
Maximal	125
Minimal	50
Depth of drilling, mm	up to 500
Angle of drilling	at any angle
Rotation frequency, rpm	850/1350
Capacity of electric motor, kW	2.2
Voltage, V	220
Dimensions, mm	700 x 500 x 1400
Weight, kg	100

The sector is equipped with new "Diafor" machine tool models 110, 150, 200 and 313 for drilling various openings ranging in diameter from 20 to 260mm to a depth of from 300 to 1,000mm. These machine tools range in weight from 21 to 100 kg.

The D-15YeS concrete cutting machine was demonstrated during cutting of reinforced concrete road slabs. This machine has a segmented diamond cutting disk with diameter of 1,000mm. Its cutting depth is 420mm and cutting speed is 20-30 cm/min.

Along with the diamond sector, a sector on the integrated application of new pneumatic punches has also been created within the administration, along with a specialized sector on vibration vacuuming. This sector is equipped with the appropriate effective equipment, concrete pump truck and concrete mixer trucks.

The seminar participants were also given a demonstration of a rock-breaking hydraulic wedge installation in action. This machine is an innovation in

* MEKHANIZATSIYA STROITEL'STVA, 1984, No 2.

world application. In a few seconds, the installation's five hydraulic cylinders break up the reinforced concrete (granite filler in concrete M300) which is reinforced with steel rods 15mm in diameter and 120 x 120 mm grid. Each hydraulic cylinder builds up a pressure of over 500 atm which is transmitted with 270-500 ton-force to the walls of the hole, which has been predrilled to a depth of up to 750mm. The labor expenditures for disintegration have been reduced to 1/15-1/25 those required for traditional methods, while the expenditures for diamond instruments have been reduced to 1/75 the previous value.

For purposes of further reducing the expenditures of manual labor and increasing labor productivity at construction sites in Moscow and Moscow Oblast by means of widespread introduction of mechanized instruments, construction-finishing machines and other means of small-scale mechanization, the seminar participants feel it necessary to recommend the following to the main construction administrations of Mosgorispolkom, Mosoblispolkom and other construction organizations and departments: to complete in 1984-1985 the concentration of means of small-scale mechanization in accordance with the basic positions on the tasks and functions of managing small-scale mechanization in construction; to organize general instrument management at construction sites in accordance with the statute on the organization of instrument management in construction; to ensure the widespread introduction of progressive technology and organization of finishing work production and the equipment of brigades performing finishing work with standard sets of effective means of small-scale mechanization; to organize the manufacture of means of small-scale mechanization and accessories which are not being produced by industry with consideration for the nomenclature recommended by TsNIIOMTP [Central Scientific-Research and Experimental-Design Institute for Organization, Mechanization and Technical Aid to Construction]; to increase the technological efficiency of project decisions for the purpose of maximally reducing the expenditures of manual labor in performing construction-installation work. This includes the introduction of industrial finishing methods; the application of progressive designs excluding manual operations in installation work; the rational planning of engineering communications in combination with building constructions and finishing of buildings and structures, as well as other project decisions determining a significant reduction in the expenditure of manual labor.

It is necessary to increase the responsibility of chief engineers at construction-installation organizations for the technological level of engineering preparation, keeping in mind the following: the application of progressive technological processes and effective means of mechanization; the equipment of brigades and sections with technological complements (standard complements).

It is also necessary to ensure the formulation of the mechanization pool and the provision of construction-installation organizations in accordance with the volumes, structure and conditions of work production.

Other goals are to ensure the effective application of available means of mechanization by means of improving the organization and management of building production and organization of labor; to improve the quality of technical servicing and repair of means of mechanization, and to improve the level of training of machinists, operators and repair workers servicing the means of mechanization.

It is also necessary to create a council of innovators under Mosgorispolkom from among the number of innovators in construction organizations. This council would review the following questions: the specific types of labor consumptive jobs which are performed manually and the effective means of mechanization which would ensure the replacement of manual labor; the progressive technologies and means of accelerating their introduction into production, as well as other achievements in scientific-technical progress in construction which would ensure an increase in labor productivity and improvement in work quality.

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CONSTRUCTION METHODS AND MATERIALS

OUTPUT RATE, LOW QUALITY OF CONSTRUCTION MATERIALS NOTED

Moscow BYULLETEN' STROITEL'NOY TEKHNIKI in Russian No 12, Dec 84 pp 9-11

[Unattributed article, "USSR Minstroymaterialov's Efforts to Develop Production of Progressive Construction Materials and Products"]

[Text] On 4 September 1984, the USSR Gosstroy [State Committee for Construction Affairs] board examined USSR Minstroymaterialov [Ministry of the Construction Materials Industry] efforts to develop production of progressive construction materials and capital construction products. It was pointed out that the ministry is making a determined effort in this direction.

For four years of the current five-year plan period, the volume of industrial output production for USSR Minstroymaterialov has seen an overall increase of 15 percent, including a 19 percent increase in effective types of cement, a 36.4 percent increase in thermal- and sound-insulating linoleum, and a 3-fold increase in production of seriographically-printed ceramic floor tiles.

Sectoral enterprises have developed production of asbestos cement articles, produced via the extrusion method, of improved gypsum drywall sheets, a number of new types of architectural-construction and thermal-absorbent glass, which is produced in thermal-insulating mineralized sheets with improved rigidity, polymer materials for interior finish work in buildings, and certain other progressive construction materials.

Incidental by-products and wastes, such as ash, slag, coal-enrichment wastes and phosphogypsum are utilized in the manufacture of construction materials and products.

At the same time, there are serious shortcomings in the work being done by USSR Minstroymaterialov to develop production of progressive construction materials and products.

The proportion of new progressive materials and products in the overall production volume of construction materials amounts in all to 8-10 percent and has no appreciable effect on technical progress in the construction industry. In 1983, this ministry fulfilled only 24 of 30 its basic assignments for production of new progressive materials. In the first half of 1984, nine assignments went unfulfilled.

Very little ultra-quick-setting cement, 550-600-mark cement, which employs catalyzers and super-peptizers, or self-stressing cement, is being produced. The output of decorative cements is slowly increasing. Production of barium-containing cement, and NTs-40-mark cement is developing unsatisfactorily.

Production volumes of effective roofing and waterproofing materials, faced roofing paper and fiberglass roofing material are increasing slowly. Work on changing the industry over to the production of faced roofing paper with asphalt additions of 2 and more kg/m^2 has gone nowhere. Efforts to develop production of effective thermal-insulating materials, including mineralized sheets having improved rigidity, are inadequate. Development of production of mineralized interwoven mats has bogged down.

The asbestos cement industry is lagging behind the leading achievements with regard to the products list, the assortment and the quality of its output. Rates for technical progress have slowed in this subsector during the last few years. Up to now, production of corrugated asbestos cement 2.5- and 3.3-meter construction sheets, and large-size reinforced asbestos cement decking has not yet begun.

The wall materials industry occupies the lowest technical level, primarily in clay brick production. Up to 80 percent of the workers in this field work manually. Brick quality is slowly improving, and the output of facing bricks has shown a moderate increase for three years of the current five-year plan period. The assignment for raising the technical level of construction brick production is being unsatisfactorily fulfilled.

Efforts to develop production of gypsum binding materials and products which utilize them is going slowly, as is work on developing new polymer-based flooring and wall-finishing materials and the organization of dry-wall plastering mixes.

A large portion of the plumbing fixtures produced by this ministry has low grade specifications and technical-economic indicators. Outdated models of this equipment are slow in being taken out of production.

Energy-saving production processes are being introduced at an intolerably slow pace. Thus, work has been going on for over five years in the development of low-temperature (saline) cement manufacture, which permits a 15-22 percent reduction in fuel and power outlays, and a 20 percent increase in equipment productivity.

The assignments calling for the preferential growth of "dry" process cement production are being unsatisfactorily fulfilled. Up to now, the Krivoy Rog, the Navoiyskiy and the Novo-Karaganda cement plants, which operate by the "dry" method, have not brought their growth out even to the plan indicators which were in operation from 1975 to 1978.

The enterprises of this sector are producing inadequate volumes of building materials and high-quality productions. Very little highest-grade wall, thermal-insulation, padded roofing and insulating material, and precast ferro-concrete is being produced.

Many types of building materials and products have low plant readiness, and deliveries to the construction sites are incomplete. Thus, extruded asbestos cement panels are delivered without mounting hardware or vapor seal.

The ministry is falling short in fulfilling its assignment to increase shipments of packaged products, and to manufacture containers, both of which lead to huge losses of building materials and products.

One of the reasons for the slow spread of the fundamental problems of making better technical progress in the sector is the low technical and economic level of a number of the developments executed by USSR Minstroymaterialov's scientific research institutes. No scientific reserve has been created in the individual institutes, and this makes no provision for the development of technical re-equipping work for a number of the building materials industry's works and subsectors. The time periods for developing and introducing new technology (progressive types of sleepers, "Bessalite" cement, expanded clay aggregate having a volumetric mass of up to 400 kg/m^3 and so on) continue to drag on.

Despite inadequate growth in the production of progressive building materials and their scarcity in the construction industry, USSR Minstroymaterialov fails every year to fulfill the state plan for capital investments for development of the sector.

The USSR Gosstroy board has acknowledged the need for USSR Minstroymaterialov to make provision in their plan drafts for the 12th Five-Year Plan for:

a considerable expansion in the production of effective building materials and products, and for starting up production of new products while meeting the construction industry's requirements for these materials and products in the necessary volumes;

widespread introduction of energy-saving procedures which will economize on fuel and other material and technical resources, and the development, first of all, of the production of cement by the "dry" and "semi-dry" methods and of low-temperature (saline) technology.

The USSR Gosstroy board recommended that USSR Minstroymaterialov entrust its subdepartmental organizations to:

develop special-purpose programs which will insure production of effective building materials and products during the 12th Five-Year Plan; to put planned capacities into operation at brick plants; to greatly increase the extent to which ash and TES [Thermal Electric Power Station] slags and other production wastes are used; to make use of secondary heat in cement, glass, ceramics and other works;

to develop a sectoral integrated program of operations for the 1985-1990 period to improve the ministry's products list and improve the quality of the basic types of products;

to provide a conclusion regarding the planning indicators for the Krivoy Rog, Navoiyskiy and Novo-Karaganda cement plants, which operate with the "dry" method, and to develop in 1985, with the cooperation of Minstroydormash [Ministry of Construction, Road and Municipal Machine Building], measures for the improvement and manufacture of the basic production equipment needed to produce cement by this method;

to finish construction and start-up and trouble-shooting operations in the first half of 1985, and to make sure that the industrial production lines for producing cement by the low-temperature (saline) process are in operation at the Akhan-Garan Cement Plant;

to guarantee production of barium-containing cement at the Karachayevo-Cherkesskaya plant in quantities sufficient to meet the needs of USSR Minenergo;

to take measures toward the unconditional fulfillment of the ministry's stipulated 1985 obligations for production volumes of self-stressing cement, including NTs-40 brand;

to develop and carry out measures, within the ministry's enterprises, which will increase the output and improve the quality of ferroconcrete and asbestos cement pressure pipe and ferroconcrete railroad ties, with a certification of high quality for no less than 15 percent of these products, and finally, measures calling for an increase, to begin in 1985, and on the instructions of USSR Minvodkhoz [Ministry of Land Reclamation and Water Resources], for increased production of high-pressure asbestos cement pipe for a working pressure of 18 at's [technical atmospheres], and with full-strength welded joints;

to take measures to speed up completion of assignments to set up capacities for glass [steklyannyy] pipe production;

to increase the output of mechanized and automated water heaters, and to initiate production of modular boiler houses which operate on solid fuel with mechanized fuel-supply and ash-removal systems, and production of other efficient boiler equipment;

to adopt measures to increase production of high-quality building materials and products and, in first place, of wall and thermal-insulating materials (including brick), of precast ferroconcrete (including pressure pipe], of padded roofing and insulating materials, and measures to provide for delivery of these products in complete sets which include connections, gaskets, hangers and other items, and measures for the unconditional completion of assignments for shipping these materials in containers and proper packages.

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END